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This study was done to develop a uniform measure of clinical productivity among Family Practice physicians for specific diagnoses in an outpatient treatment setting by conducting a study comparing data from selected Army Community Hospitals participating in the ACDBS study.

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A STUDY TO DEVELOP
A UNIFORM MEASURE OF CLINICAL PRODUCTIVITY
AMONG FAMILY PRACTICE PHYSICIANS
FROM SELECTED ARMY COMMUNITY HOSPITALS

A Graduate Research Project
Submitted to the Faculty of
Baylor University
In Partial Fulfillment of the
Requirements for the Degree

of
Master of Health Administration

by

Captain Monte R. Priebe, MSC
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I. INTRODUCTION

Conditions Which Prompted the Study

Medical care costs have been under scrutiny for over a decade, prompting constraints, reanalysis, and regulation, culminating in present day use of prospective payment systems to bring them under control. Along with development of Diagnostic Related Groups (DRGs) for inpatient care, there has been a desire to obtain more reliable measures of productivity in ambulatory health care. Provider productivity has become one of the issues health care administrators need to assess in order to become more effective in producing beneficial outcomes for the patient in this cost-conscious environment.

In the civilian sector, the physician plays a key role in health care for he is both the customer and the person by which revenue is produced. An economic view of health care predicts that the more patients that can be seen in a given amount of time, the greater the revenue produced, considering the resources used in the encounter. The military physician is the focal point of productivity in ambulatory care. He has direct impact on the volume of patients seen, availability of appointments, resources allocated and ultimately the satisfaction of the patient. There is, however, no increased monetary incentive to the physician with increased productivity, unlike his civilian counterpart.

The Surgeon General of the Army desires that every Army family should have a designated primary care physician. The realization of such a goal further impacts on physician availability and accessibility. This

also places emphasis on the physician's ability to diagnose, treat, and manage patient care in an ambulatory setting in a timely manner. This further prompts the need to establish some measure(s) of productivity in family practice.

Collection of outpatient provider productivity-related data has not been actively pursued in the military setting until recently. An effort by the U.S. Army Health Care Studies and Clinical Investigations Activity established the Ambulatory Care Data Base Performance Measurement Study (ACDBS). Six sites in the Army were selected to participate in providing a data base for comparative studies on several levels. Bayne-Jones Army Community Hospital and Blanchfield Army Community Hospitals are two of these sites. They were chosen because there is a close comparison between these medical care facilities in regard to the scope and breadth of family practice in the ambulatory care structure. Likewise these two sites gave access to data collection on combat division personnel (soldiers) as well as large family member and retired populations.

In the military setting, Bayne-Jones Army Community Hospital (BJACH) at Fort Polk, Louisiana, is a general acute care facility with a large family practice base for both outpatient and inpatient care. The population served includes: 15,000 active duty (A/D) soldiers; 12,000 dependents of active duty; and 29,000 retirees and their dependents. Each of 13 physicians is assigned a panel size based on the units assigned to post. Each panel has approximately 2400 patients assigned for care. As such, the productivity of the hospital has been linked to overall productivity in family practice. The need to be productive is a key

ingredient in the effectiveness of family practice physicians to meet the needs of the population served in what is considered a remote location at Fort Polk. The family practice concept provides primary care in a comprehensive modality with emphasis under this specialty to take into account the social, psychological, economic, cultural, and biological dimensions of patients who present for care.

This broad base approach to care also attributes to family practice a triage and referral function to ensure proper screening of the patient complaint and proper referral to other specialties. Family practice is hospital based, and requires that the physicians involved have inpatient care responsibilities and are active in taking call on a rotating schedule. This impacts on the outpatient productivity of the individual physician.

Blanchfield Army Community Hospital, Fort Campbell, Kentucky, is a large general acute care facility with additional teaching responsibilities, however these do not impact the family practice department. Physicians in family practice have inpatient responsibilities in addition to their outpatient clinics the same as Fort Polk. The population served includes 21,513 active duty soldiers; 20,779 A/E dependents, 30,101 retirees and 74,141 retired dependents. At the time of the study, the total assigned personnel under each physician was less than 600 each, as defined by the limited size of their family practice panel. Other practitioners shared in the responsibility for primary care of such a large population, to include internal medicine and pediatrics.

Family practice performs a triage and referral function as well at Fort Campbell, due to the broad spectrum of care provided. Ideally, referred patients are well screened to insure proper referrals based on need. This implies that family practitioner productivity is of key importance as a result of the multiple role played and as a referral base for other specialties in providing quality care.

The availability of ACDBS data plus the interest and support of the two hospital commanders lead this investigator to propose a study of provider productivity at BJACH compared to Blanchfield Army Community Hospital. This would allow us to investigate the possibility of setting a standard against which to compare family practice physicians. The results of this effort should yield significant information leading to ambulatory care performance measurement (Begg, 1986).

The achievement of a more precise measure of provider productivity in the military setting, it was felt, would be of significant value to military health care planners and administrators alike in allocating providers and related resources to ambulatory care areas. Those patients serviced by the primary care providers would also receive benefit by providing a reasonable standard of productivity by which providers at the same or similar Army communities could be compared in providing the same services to their patients.

Statement of the Problem

To develop a uniform measure of clinical productivity among Family Practice physicians for specific diagnoses in an outpatient treatment setting by conducting a study comparing data from selected Army Community Hospitals participating in the ACDBS study.

Objectives

1. Conduct a literature review concerning physician productivity in family practice and primary care outpatient settings.
2. Determine what will constitute physician productivity for the purposes of this study.
3. Utilize the Ambulatory Care Data Base Study (ACDBS) data to derive patient treatment and provider information.
4. Using statistical procedures, measure physician productivity based on the data gathered.

Criteria

Physician productivity is defined as the mean physician time spent (in minutes) with patients of similar diagnoses categories during the individual outpatient clinic visit or encounter. The mean encounter time will be the basis of the study. The direct encounter is a face-to-face meeting of the patient and the physician. This includes as well the time taken to write in medical records, order tests or procedures and counsel with the patient.

Assumptions

1. The quality of health care provided by all physicians under the study will be equivalent, similar and satisfactory.
2. Sufficient ancillary personnel are available to assist the physician in seeing patients, thereby not having a negative impact on physician productivity. The tasks of screening and taking vital signs will have been completed before the physician-patient face-to-face encounter begins.
3. All times recorded for the encounter will be face-to-face, and not include patient waiting time prior to or after the encounter with the physician.
4. The ACDBS data base study will continue for the duration of the study period, with no change in data base accumulation methodology or loss of the data base manager as the study progresses.

Limitations

1. The range of diagnoses discussed will be a function of the characteristics of injury or illness of the patient population under study during the data accumulation.
2. Mean encounter times will be calculated using the most frequent common diagnoses reported on the patient encounter form used in the ACDBS study. This will be determined based on the frequency of reported diagnoses for the period of the study, and of those diagnoses common to all reporting physicians.

3. The physician sample size will be limited by the number of physicians engaged in face-to-face patient encounters, and their available hours for outpatient care.

Review of the Literature

Hospital-based outpatient care is the fastest growing component of any type of health care today. In terms of expenditures, community hospital ambulatory care is expected to increase from \$20 billion in 1986 to \$46 billion by 1990 (Arnett, et al., 1986). Due to the demographics, advanced technology and economics in the health care industry, Medicare and private insurance companies have created incentives to encourage hospitals and physicians to treat patients in ambulatory settings. There is an increasing trend of more frequent visits to hospital outpatient departments relative to a declining number of inpatient days. In 1974, for example, there were 189 million community hospital outpatient visits across the United States, compared to 212 million in 1984--a 12% increase (American Hospital Association, 1985).

In consideration of the increases in outpatient care, many authors have turned their attention to the primary care practitioner, especially general and family practice physicians. Since physicians, not institutions dispense health care, and recent institutional changes and technology have not made health care delivery more productive in terms of requiring fewer physicians, we may assume there will be an increase in demand for physicians in the future (Jackson, 1987).

From 1970 to 1980, there has been a statistically significant decline in hours worked by all physicians of approximately 1.5 hours or 3%, and the decline for primary care specialties was even greater at 3.7% (Freiman and Marder, 1984). Add to this the findings of Cherkin, Rosenblatt and Hart (1984) that family practice physicians who are residency trained, see fewer patients per hour, but spend commensurately more time per patient visit than their counterparts without residency training. This relationship in their study persisted in spite of controlling for a variety of physician and practice characteristics, including physician age, practice organization, geographic region, and age of patients treated. Not surprisingly, many hospitals have instituted individual productivity studies, since wages and salaries routinely constitute more than one-half of the average civilian community hospital's operating budget. (Harju and Sabatino, 1985)

In the military setting the emphasis has not been entirely on cost containment. Because of recognized problems in access to military medical care, availability of resources to meet demand, and the beneficiaries perception of the medical care system, improvements in physician productivity may lead to solutions in these areas.

An interest in distribution of resources was voiced by Fetter, Averill, Lichtenstein, and Freeman (1984), who recognized the significance of ambulatory medicine in the health care economic sector. The assessment of health care provider productivity was considered to be an integral part of their evaluation. The possibility of a new method of

reimbursing for ambulatory care (Lion, Henderson, Malbon, Wiley, Noble, 1984) using a classification system similar to diagnosis related groups (DRGs) was likewise enlightening and was examined in preparing the ACDES study.

The trend in the American health care field has been to promote cost containment and has created interest in the development of productivity standards to measure the efficiency of health care providers. With 54% of the physician visits occurring in the ambulatory health care clinic (Roemer, 1982), there is an obvious need to develop standards and performance criteria. Although some administrators express concerns over attempts to apply standards to the medical field, most might welcome the development of productivity standards as a way to improve services and allow for optimal staffing decisions. Griffith (1978), among others has called for new guidelines for decision makers in the health care field that would establish common measures of performance. Using such measures of performance, ambulatory care clinics could begin to compare themselves with clinics in other communities, states, and the nation as a whole. The same would be true of comparisons made between similar military treatment facilities.

Literature on health care productivity reveals a wide-spread consensus on the inadequacy of the outpatient clinic statistical base and reporting indices to date (Federa and Bilodeau, 1984; Herkimer, Eberhard, Pollard, Uhl and Zaretsky, 1977). More recent studies include specific areas of focus and the use of computers in productivity monitoring and

modeling (Giclice, 1983). Some studies examine the use of simulation and mathematical formulas to determine manpower distribution (Burkhart and Schultz, 1979; Minch, 1983).

Other activities that may be affected by computers include: managing variability in demand (Sahney, 1982), forecasting health care services demand (MacStravic, 1982), and measuring hospital expenses on a cost per unit basis (McCormick, 1979; Suver 1981; Templin, 1984). None of these studies have dealt specifically with the problem of establishing productivity standards against which to measure the levels of staffing or professional performance in ambulatory care clinics. There is support, however, to continue such studies.

Medicare's decision in 1983 to use diagnosis related groups (DRGs) as the unit of prospective payment for inpatient care, had forced hospitals into what appears to be an industrial revolution (Arbitman, 1986). Traditional management in this area was by functional departments and process management, which has become management by case types or product line management, requiring information for planning, budgeting, utilization review, quality assurance, etc. DRGs are not the optimal patient grouping system for such activities.

Many different patient grouping systems exist and others are under development. Each has unique characteristics that make it more or less suitable for hospital management activities. Much of the study done in this area has an inpatient emphasis, but much has also been done on outpatient groups. Some efforts are even underway that would integrate the inpatient and outpatient experience into one grouping system

reflective of a total episode of care. A sizeable task of classifying large numbers of discrete diagnoses into clusters (Scheeweis, et al., 1983) was performed using 1978-79 National Ambulatory Medical Care Surveys (NAMCS). These clusters represent essentially similar pathophysiologic conditions and are compatible with the International Classification of Diseases (ICD-9-CM) used in the ACDBS.

A successful patient classification system must balance precision and homogeneity in patient types with the need for administrative usefulness. Patient classification schemes should be dynamic, not static and be adaptable to the rapid changes in medical practice. No system available at this time meets all of the desired criteria for all management purposes. The characteristics, strengths and weaknesses of the most well published systems are described and evaluated in more detail at Appendix A.

Senior Department of Defense leadership recognized in 1982 that the traditional measure of health care workload, the Medical Care Composite Unit or MCCU was not adequate to define and analyze all parameters of inputs and outputs in the military health care system. Army Medical Department (AMEDD) Medical Treatment Facilities (MTF), could no longer accurately reflect resource utilization, the sophistication of ambulatory medicine nor the impact of committee, quality assurance and readiness activities on the cost of patient care (Coventry, 1984). A Tri-Service Performance Measurement Work group was appointed to conduct a Performance Measurement Study (PMS) to include an ambulatory care portion. The

Surgeon General of the Army directed the Army's Health Services Command (HSC) to conduct a study to evaluate current measures of AMEDD health care system performance and, as required, develop better measures and workload data capture systems which accurately reflect actual resource utilization. Under the direction of the Health Care Studies and Clinical Investigation Activity (HSCSCIA), the Ambulatory Care Data Base Study (ACDBS) was established to capture previously non-existent diagnostic and resource use data in the outpatient setting.

Objectives of the ambulatory care portion of the PMS study are the following:

1. Develop a decentralized and automated system necessary for an ambulatory care database.
2. From data captures, develop weighted measure of outpatient workload.
3. Assure that the database has relevance for clinical practice and research.
4. Evaluate the system's feasibility for continued use and proliferation throughout the AMEDD.

Along with with these objectives, it was decided by Major General Floyd W. Baker, then Commander, HSC, that the system would allow centralized data capture to the Defense Medical Systems Support Center, Fort Detrick, Maryland, and yet allow local providers and managers a data base for management and resource utilization decisions. It was envisioned the system would become a prototype for a Department of Defense (DOD) system.

Six Medical Treatment Facilities (MTF) were chosen as study sites that would represent a cross section of AMEDD health care in various locations and with some different demographic and treatment parameters. The following six sites were chosen:

Fort Polk, Louisiana

Fort Campbell, Kentucky

Fort Bragg, North Carolina

Fort Jackson, South Carolina

Redstone Arsenal, Alabama

Brooke Army Medical Center, Fort Sam Houston, Texas

Forms used in data capture are coded using ICD-9-CM for diagnoses and the American Medical Association's Current Procedural Terminology, Fourth Edition (CPT-4) for procedures. An Outpatient Registration Form was completed by all patients upon their first encounter with the health care facility (Appendix B). This one-time document provides basic demographic data including sex, birthdate, social security number, zip code of residence, unit of assignment, branch of service, pay grade and duty MOS (Military Occupational Specialty). Each health care provider, i.e., any person who can make a decision as to the disposition of the patient, or provides significant treatments or procedures, is registered by means of a Provider Registration Form (Appendix C).

Original input for the procedures and diagnoses during an outpatient visit (encounter) are documented on a Primary Care Patient form found in Appendix D. Each encounter form is initially filled out by the patient

and/or the administrative staff at the front desk before their visit. The provider section, like a billing form, is completed by the clinician/practitioner. This requires only pencil marking an appropriate bubble of the Optical Mark Sense Reader (OMR) form. Hence, the colloquial term "bubble form" or "bubbling in the patient" among the staff. The time expended by the physician is documented at the time of the visit and includes only the face-to-face encounter time by the treating physician.

Research Methodology

The ACDB study provided the groundwork and sound data collection from which to embark. Incorporating lessons learned from the AVG studies, Diagnosis Clusters and National Ambulatory Medical Care Surveys, the ACDB study was ideal for use as a data base, with a readily available automated system to draw upon. Clinical relevance of the data base was established by the project staff, a thorough development of the data collection form had been accomplished and hiring and training of support personnel had been completed. Additionally, at each site the necessary automatic data processing equipment (ADP) had been procured. Fiscal Year 8/ funds were already provided, and each of the six sites were committed and supportive of the study. These facts gave the confidence necessary to suggest this proposed research into a segment of what was fast becoming a large data base. The literature review supported the fact that the study was

structurally and objectively sound, plus it allowed for sufficient flexibility at the local level to design and capture data for unique management reports. Given the excellent environment in which to work, the opportunity existed to delve into sparsely documented territory, and perhaps offer an alternative or additional measure of productivity, to those already under consideration for Department of Defense medical treatment facilities.

The Problem Statement, rephrased for the purposes of this statistical comparison, may now be asked as research questions:

1. Is there a significant difference among all family practice physicians included in the study, in encounter times for selected diagnosis categories?
2. Is there a significant difference in encounter times, by diagnosis categories between Bayne-Jones Army Community Hospital, Fort Polk, Louisiana and Blanchfield Army Community Hospital, Fort Campbell, Kentucky using the ACDE study data?

All assigned staff physicians located at the two locations were participants in the research. The study was already in progress for 20 months at the time designated to collect the data, and no "Hawthorne effects" were expected. It was not announced to family practice physicians until data had been retrospectively withdrawn, that this specific research was being conducted. This investigator is convinced that practitioners did not alter their normal routines at all during this period, nor was any indication of surprise or displeasure voiced by staff members. The

critical measure of encounter time was filled in on the Primary Care patient encounter form as it was completed by the physician.

Physician and patient confidentiality were maintained throughout. Physicians were identified by an I.D. code number only, preassigned at the beginning of their participation in the study. No pilot study was necessary as the forms, process and data needed were established and already part of the ongoing project. Patient Encounter forms were retrieved daily to the ADP assembly area to be electronically scanned for data and subsequently entered into a computerized data base. Optical mark sense computer technology was utilized as being the most appropriate and cost effective method of data collection.

Each site was provided the following ADP equipment for data capture and transfer:

- 2 IBM personal computers (PC-XT) with 250K bytes of memory each.

- A Genicom 3014 printer (160 CPS)

- An IBM Color (RGB) Monitor

- 2 Iomega (Bernoulli Box) removeable 10 MB (later 20 MB)

- A Case-Rixon PC212a cartridges Internal Modem

- A National Computer Systems (NCS) Optical Mark-Sense Reader/Scanner

- An AST (accelerator) Board (Megaplus 11)

The Iomega 10 MB cartridges were used for transmitting the data from each site to the Fort Detrick Data Processing Center, where the main frame data base was located. Data base management was accomplished through use

of a fourth generation programming language and software that was virtually identical in the microcomputer and mainframe versions, (FOCUS Data Base Management System).

The Patient Registration form was to be completed at the patients first encounter for health care. Prior to the development of the form consideration had been given to using existing DOD and Army data bases for patient registration. Unfortunately the study data elements for ACDB were not identical to those found in the Defense Eligibility Enrollment System (DEERS) or in the Army Standard Installation Division Personnel System (SIDPERS). Registration elements included the minimum demographic variables necessary to allow the automated capture of Medical Summary 302 Reports (MED 302 Reports) and Uniform Chart of Accounts (UCA) Reports.

The Provider Registration forms were completed by all health care personnel authorized to render medical treatment. Enrollment was essential to determine the type of provider giving the care during the encounter.

Each Patient Encounter form essentially consisted of four sections. The first portion was completed by the patient and identified them by pertinent demographic information. The second part contained administrative information completed by the clinic receptionist or secretary. The third portion pertained to clinical management of the patient; and the last section contained a menu of clinic or specialty specific diagnoses, problems, or reasons for visit and procedures, services and evaluations. Both the third and fourth sections required completion by health care providers.

The diagnostic and procedural menus were developed for every specialty utilizing a modified Delphi technique (Polit and Hungler, 1983). It most closely resembles a collection of what the physician would place on a billing form if they were in private practice. The Primary Care form was a consolidation of diagnoses and procedures from the Emergency Room (ER), the Troop Medical Clinic (TMC), the Acute Minor Illness Clinic (AMIC) and the Battalion Aid Station (BAS). The length of the form to be filled out met with some resistance from practitioners who desired a more simplified form. This was not possible due to the variety of patients seen. Some lack of standardization in menu listings was also confusing to family practitioners.

ACDB reliability of data was studied in a five month period during which all six sites were visited and on-site medical records audits performed. With randomly-generated lists of medical records, a total of 9,015 patient encounters were reviewed. Analysis showed a mean score of 10.56 (out of a maximum of 11) with a standard deviation of 1.27 and a range of 1-11, in scoring how accurately the ACDB information matched to medical records entries.

Unfortunately for this investigator, the funding for the ACDB study was discontinued in fiscal year 88 and with it, the support personnel, computer equipment and the access to local data base and management information were withdrawn. It became a long and tedious struggle to locate assistance from this rural area in Louisiana to complete the research. After two visits to the HUSCIA offices and support from Maj(P) Jeffery P. Moon for data collection and discussion with

Dr. Ken Finstuen, statistics advisor, Academy of Health Sciences, Fort Sam Houston, Texas, I was finally able to find computer support for completion of the research. Dr. Robert Breckenridge, Head of the Psychology Department, Northwestern University, in Natchitoches, Louisiana, offered support of a computer program designed to analyze and describe statistical problems, entitled CRUNCH. It is user friendly and has sufficient power to run up to 50 predictor variables for a multiple regression model. It is, however, PC driven and slow to do sorting on large amounts of data.

The data collected is unbalanced due to the difference in total family practice physicians represented (Table 1) at each site, with eight physicians at Ft. Campbell, and 13 physicians at Ft. Polk. This requires us to choose the multiple regression analysis model for it allows us to compare variables that may be unequal in size, and regress them onto the universal mean, which is represented by a line. The model chosen to address the research questions is represented by the equation:

$$y = a + b_1x_{11} + b_2x_{21} \dots + b_{21}x_{211} + e_1, \text{ where}$$

y = the dependent variable (encounter time)

a = the y intercept, a constant

b = a Beta weight that applies to the value x_1

x = the independent variable of each observation

e = the error term

TABLE 1.

Family Practice Physicians by Provider I.D. Code for Fort Campbell and Fort Polk, and Total Patient Encounters per Physician for April 1987.

| Site 1 - Campbell | Provider I.D. | Visit Count |
|-------------------|---------------|-------------|
| | B2610 | 413 |
| | C7463 | 487 |
| | M8056 | 499 |
| | S0352 | 153 |
| | S5623 | 336 |
| | T4804 | 260 |
| | W2947 | 436 |
| | W9900 | <u>699</u> |

Total Occurrences, All Diagnoses: 3,283

| Site 2 - Polk | Provider I.D. | Visit Count |
|---------------|---------------|-------------|
| | A5538 | 349 |
| | B4479 | 258 |
| | D5856 | 304 |
| | F1089 | 343 |
| | G0831 | 362 |
| | H4880 | 383 |
| | H7224 | 288 |
| | J8157 | 429 |
| | K6929 | 155 |
| | O2539 | 222 |
| | S6327 | 452 |
| | T8937 | 488 |
| | W7032 | <u>331</u> |

Total Occurrences, All Diagnoses: 4,364

TOTAL, Both Sites, All Diagnoses 7,647

Assumptions:

1. Each of the observations are an independent sample of size n drawn from the population.
2. Each of the populations is normally distributed.
3. Variances of the population are equal.
4. The subpopulations of y all lie on the same straight line. This is the assumption of linearity, expressed as:

$$\mu = \alpha + BX$$

where μ is the mean of the subpopulation of y values for a particular value of X and α and B are population regression coefficients. Geometrically α and B represent the y intercept and slope respectively.

Hypothesis:

$$1. H_0 : \alpha_1 = \alpha_2 = \dots \alpha_i = 0$$

$$H_A : \text{not all } \alpha_i = 0$$

Rejection of this H_0 would mean that it may be concluded that there are differences in mean encounter times attributable to diagnosis categories.

$$2. H_0 : \beta_1 = \beta_2 \dots \beta_i = 0$$

$$H_A : \text{not all } \beta_i = 0$$

If H_0 is rejected, then there are differences attributable to physician encounter times due to the site at which they are employed. The test statistic is used then to evaluate the observed difference between multiple samples; the difference in encounter times between multiple diagnosis categories and the difference in encounter times between physician groups at the two sites.

11. DISCUSSION

Participation Indicators

The month of April 1987, there were 7,647 recorded visits to family practice physicians using the ACDB encounter forms, for all possible diagnoses. From Table 3 we see 3,283 of those encounters were recorded at Fort Campbell (Site 1) and 4,364 were recorded at Fort Polk (Site 2). Upon selecting the 20 most frequent diagnosis categories in common for both sites, (Table 2) this reduced n to 3,186 encounters or 41.7% of the total recorded encounters for the month. At Fort Polk, the interest level remained high due to the fact that all workload that was recorded under ACDBS was the source documentation for MED 302 and UCA reports. There was no dual logging or reporting of patients for separate workload accountability other than using the encounter "bubble form".

An internal audit report at Fort Polk by Frank Hood, CPA, cited some loss of data after a random sample of medical record entries revealed that patients were seen for which no recorded ACDB encounter form had been filled out, or was lost or had not become an entry to the data base. The simple omission of a required field of data (i.e. diagnosis or time) was discovered during the form scanning process because of a designated reject/edit routine. The form was then returned to the clinic for correction. An estimated 82% of all encounters were accounted for by use of the ACDB study for workload purposes. It may be assumed that such human error as forgetfulness, ill humor, overbooking of patients, temporary absence of support personnel, etc. would account for

TABLE 2.

Twenty Most Frequent Diagnosis Categories for Fort Campbell and Fort Polk

| <u>Diagnostic Code</u> | <u>Diagnostic Description</u> |
|------------------------|--|
| V202 | Surveillance Health Development |
| V22 | Pregnancy, Normal |
| V655 | No Problem Noted |
| V700 | Exam, Medical |
| V7231 | Exam, Well Woman |
| 000 | No Diagnosis/Visit Reason Recorded by Provider |
| 0340 | Pharyngitis W/Streptococcal |
| 250 | Diabetes Mellitus |
| 37230 | Conjunctivitis |
| 3814 | Otitis Media, Serous |
| 3820 | Otitis Media, Suppurative, Acute |
| 401 | Hypertension, Essential |
| 460 | Nasopharyngitis, Acute (Common Cold) |
| 461 | Sinusitis, Acute |
| 462 | Pharyngitis, Acute |
| 7194 | Arthralgia |
| 7245 | Pain, Back, NOS |
| 7821 | Rash, (Exanthems), NOS |
| 7840 | Headache |
| 7890 | Pain, Abdominal |

some loss of documentation in any instance. Commanders at both sites continued encouragement of their respective physician staffs to complete the forms at the same time medical record entries were made.

Informal discussions with family practitioners were held to determine the physicians' attitude toward the ACDB study and the management reports derived from that data base. The only negative comment received was that individual physicians should be able to see the reports concurrently with their supervisor(s). The reports they felt could be misused as "carrot and stick" for compliance with hospital goals and competition for prized continuing medical education money to take Temporary Duty (TDY) trips. No physician to this investigator's knowledge suffered any detrimental or disciplinary actions as a result of workload recorded by use of the ACDB. Participation continued in a normal fashion both before and after the April, 1987 study.

Distribution of Diagnosis Categories

A matrix was constructed from which relative frequency distribution histograms were developed for a visual comparison of diagnosis categories by encounter times. These can be seen as figures 1 - 20. Reference should be made here of the 60 and 90 minute encounters at Fort Campbell, none of which were recorded for Fort Polk. These may have had an effect on skewing the data in the comparisons.

Frequency of occurrences by diagnosis at both sites are rank ordered on Table 3 and compared in the order in which they occurred at each location. Noteable here is the high frequency at both locations of the diagnosis, No Problem Noted. Many times providers responded that with their busy case loads they did not have the time or support staff to research the encounter and selected the no problem noted option. This option (code V655) had been intended to account for illness or injuries which had resolved themselves or to indicate there was no discernable illness/injury present. Unfortunately this problem was not recognized until several months of data were recorded. To remedy this, the code of 000 was added so computer scanning personnel could designate that No Diagnosis/Reason was recorded for the provider after correction procedures failed. The No Problem Noted code accounts for 8.7% of the ACDB total data base and is highly suspected as an inaccurate measure for this ICD-9-CM condition.

Also worthy of comment is the large number of normal pregnancy exams seen at Fort Polk (400) which accounts for 21% of all exams seen, and add to that the number of well woman exams (250) and you account for 32.2% of all visits for the month. Comparisons to Fort Campbell reflect 102 normal pregnancy exams, or 10.8% of their total, plus 84 well woman exams for a total of 186 exams or 19.6% of all exams for the month.

TABLE 3.

Frequency of Occurrence by Diagnosis, Rank Ordered, Fort Campbell and Fort Polk.

| <u>Diagnosis:</u> <u>Code</u> | <u>Description</u> | <u>Fort Campbell</u> | | <u>Fort Polk</u> | |
|----------------------------------|--|----------------------|-------------------|------------------|-------------------|
| | | <u>Frequency</u> | <u>Rank Order</u> | <u>Frequency</u> | <u>Rank Order</u> |
| V700 | Exam, Medical | 170 | 1 | 114 | 5 |
| V655 | No Problem Noted | 104 | 2 | 360 | 2 |
| V22 | Pregnancy, Normal | 102 | 3 | 470 | 1 |
| V7231 | Exam, Well Woman | 84 | 4 | 250 | 3 |
| 3820 | Otitis Media, Suppurative, Acute | 84 | 5 | 178 | 4 |
| V202 | Surveillance Health Development | 41 | 6 | 55 | 12 |
| 401 | Hypertension, Essential | 41 | 7 | 108 | 7 |
| 460 | Nasopharyngitis, Acute (Common Cold) | 36 | 8 | 113 | 6 |
| 7821 | Rash (Exanthems), NOS | 32 | 9 | 66 | 9 |
| 000 | No Diagnosis/Reason Recorded By Provider | 31 | 10 | 59 | 11 |
| 0340 | Pharyngitis with Streptococcal | 26 | 11 | 51 | 13 |
| 7194 | Arthralgia | 26 | 12 | 32 | 20 |
| 7890 | Pain, Abdominal | 25 | 13 | 63 | 10 |
| 461 | Sinusitis, Acute | 24 | 14 | 36 | 19 |
| 37230 | Conjunctivitis | 23 | 15 | 46 | 14 |
| 462 | Pharyngitis, Acute | 23 | 16 | 70 | 8 |
| 3814 | Otitis Media, Serous | 20 | 17 | 45 | 15 |
| 250 | Diabetes Mellitus | 19 | 18 | 41 | 17 |
| 7840 | Headache | 19 | 19 | 39 | 18 |
| 7245 | Pain, Back, NOS | 18 | 20 | 42 | 16 |
| TOTAL: | | 948 | | 2,238 | |

Patient Demographics

Fort Campbell and Fort Polk have a recorded total of 670 male, and 1783 female patient visits. This is however, only a partial representation due to the fact that 733 out of the 3,186 encounters lack a corresponding patient registration form, which included the patient demographic data. Twenty-three percent of the demographic data is therefore unavailable for complete description of the representative, sex and beneficiary category information. Overall, the ACDBS data still lacks 24.3% of the patient encounter demographic data and initiatives are under way to link these unknowns to data found using SIDPERS and DEERS.

The greatest number of patient encounters is represented in Table 4, among the 1 - 15 year old age group. The highest percentage of male visits are recorded in the 1 - 15 year old age group; while the highest percentage of visits for females is in the 15 - 24 year old, and the 25 - 44 year old age groups. This is primarily due to pregnancy related care.

Resource Utilization

The data reflected routine lab tests were requested by physicians 33 times at Fort Campbell and 189 times at Fort Polk, for 3.5% and 8.4% of the visits respectively. Likewise, physicians wrote one or more prescriptions for medications 84 times (8.8%) at Fort Campbell, and 360 times (16.1%) at Fort Polk. X-rays requested were 10 at Fort Campbell and 93 at Fort Polk for 1.0% and 4.1% of the visits respectively. Only five instances for both sites were on record for exams ordered out of

TABLE 4.

Number and percent distribution of visits by patient age and sex,
Fort Campbell and Fort Polk Family Practice Clinics, April 1987.

| Age | Male | | Female | | Not Identified |
|---------------|-----------|--------------|-----------|-------------|----------------|
| | n | % Visits | n | % Visits | n |
| Under 1 year | 156 | 6.3% | 273 | 11.1% | |
| 1 - 15 years | 354 | 14.4% | 318 | 12.9% | |
| 15 - 24 years | 40 | 1.6% | 534 | 21.8% | |
| 25 - 44 years | 40 | 1.6% | 547 | 22.3% | |
| 45 - 64 years | 58 | 2.4% | 92 | 3.7% | |
| Over 65 years | <u>22</u> | <u>10.8%</u> | <u>19</u> | <u>0.7%</u> | <u> </u> |
| TOTAL: | 670 | 100.0% | 1,783 | 100.0% | 733 |

clinic, which represented diagnostic tools such as ECG, EEG, pulmonary function tests, EMGs, adaptive appliance/equipment etc. No use could be made of this small amount of data, therefore it was not determined significant for analysis in light of the limited frequency recorded.

Research Question 1: Differences in encounter times due to diagnosis.

The first null hypothesis stated that there would be no significant differences in encounter times associated with the different diagnoses. According to the stepwise regression analysis, that is not true. We have significant differences in diagnosis categories between sites, and therefore we reject the H_0 (null hypothesis) and accept the H_A (alternate hypothesis). In the stepwise regression, the most contributing predictor variable selected was site with the calculated multiple regression results. Please see the full listing of variables in Table 5 for the stepwise multiple regression, placed at the end of the Discussion Chapter.

Null Hypothesis $H_0: \alpha_1 = \alpha_2 \dots \alpha_1 = 0$

Alternate Hypothesis: $H_A: \text{not all } \alpha_1 = 0$

Level of Significance $\alpha = .05$

Critical value $F_c = F_{.05, 15, 2934} = 1.67$

Therefore the null hypothesis was rejected.

Continued stepwise entry of variables based on the predictive nature of the F-to-enter value gave the following final list of variables diagnoses that contributed to the multiple regression analysis, along with their associated Beta weights.

The last six variables did not contribute to the regression model. Due to the low F-to-enter values these variables did not enter the regression equation.

The partial correlation is between the predictor variable and the dependent variable after controlling for the variables in the equation. The F-to-enter value is the F statistic for testing whether the partial correlation is different from zero. Tolerance is a measure of how much two or more predictor variables measure the same attribute. If they do measure the same attribute we do not wish to have them in the equation. A tolerance near zero (i.e. .001) allows two variables to be almost perfectly correlated, yet both be included in the equation. Conversely, a tolerance of near one (i.e. .999) almost never allows a second variable into the equation. The Tolerance must be between zero and one.

Research Question 2; Differences in encounter times by diagnosis
categories between Fort Campbell, Kentucky and
Fort Polk, Louisiana.

Referring again to our regression analysis, the number of variables that were significantly different reflect the fact that the site had major impact (contribution) to the model. Further studies in a correlation matrix shown at Appendix F reflect that the highest correlation figure calculated was Time and Site, again indicating the impact on the model for entering another variable into the equation.

In the stepwise regression, variables are added and removed from model one at a time according to how they reduce error variance. At each step, the CRUNCH program first looks to see if a variable entered stepwise in the model has become a "weak" predictor because of the addition of other variables. After site was entered, 14 more diagnostic variables contributed to the regression in the above order given, and with the final Multiple Regression result after 15 entries into the equation.

The mean encounter times for each diagnosis at each site are displayed in Table 4. The mean encounter time for all Fort Campbell visits is 21.5 minutes, and the mean encounter time for all Fort Polk visits is 15.9 minutes. Grand Mean for all 3,186 encounters is 18.7 minutes. Further comparison of the data involved multiple t-tests of mean encounter times for each site. All, except for two diagnoses (46 and 7890) produced significant differences in mean encounter times, at the $\alpha = .05$ level of significance. See Appendix E for a complete listing.

TABLE 6.

Mean Encounter Times per Diagnosis (to the nearest whole number)
Fort Campbell and Fort Polk.

| Diagnostic Code | Mean Provider Time (minutes) | Mean Provider Time (minutes) |
|-----------------|---------------------------------|---------------------------------|
| | Fort Campbell | Fort Polk |
| V202 | 24 | 17 |
| V22 | 20 | 16 |
| V655 | 20 | 16 |
| V700 | 20 | 20 |
| V7231 | 29 | 24 |
| 000 | 23 | 16 |
| 0340 | 18 | 12 |
| 250 | 21 | 16 |
| 37230 | 18 | 12 |
| 3814 | 18 | 12 |
| 3820 | 38 | 12 |
| 401 | 17 | 16 |
| 460 | 24 | 12 |
| 461 | 16 | 19 |
| 462 | 18 | 19 |
| 7194 | 18 | 16 |
| 7245 | 21 | 12 |
| 7821 | 18 | 16 |
| 7840 | 17 | 19 |
| 7890 | 31 | 16 |

It was expected that significant differences would be observed and the null hypothesis rejected. The t-tests served to indicate where some of these specific differences were. Analysis showed 18 of the 20 diagnoses or 90% of the data were significantly different.

The CRUNCH regression output includes a number of statistics which relate to the model as a whole and several statistics which pertain to individual variables. The overall success of the regression is summarized in the multiple R and R-square statistics. R can be interpreted as the Pearson correlation between the observed values of the dependent variable and the predicted values based on the equation. R-square is then the proportion of the variance in the dependent variable which is "explained" or attributed to variables in the model.

The adjusted R-square is a transformation of R-square which is an unbiased estimate of the population R-square.

The analysis of variance section of the output shows the partitioning of the variance in the dependent variable into variance which is attributed to the regression model and error variance. The F statistic and its associated P-value test the hypothesis that the population multiple R is zero. It is a test of the entire model. Finally, the standard error shown is the square root of the residual mean sum of the squares.

For each variable in the equation, five columns are shown. The first, B is the estimated coefficient of this variable in the regression equation. The second value Beta (β) is a standardized regression coefficient. Beta is simply the B value multiplied by the ratio of the

standard deviations of the dependent and predictor variables. Unlike the B values, the Beta values of all predictors have the same units and therefore can be compared to each other. The standard error column contains the standard error of the B value. The square of the ratio of B to its standard error, generates the F-to-remove value. This can then be used to test the hypothesis that the true coefficient for a particular variable is zero.

On the basis of the analysis, we must therefore reject H_0 and accept H_A that not all encounter times for physicians at the two sites were equal. There were significant differences mainly due to the site involved.

Other Considerations on Encounter Times

A higher patient volume afforded by visits of a shorter duration can only be accomplished if all elements work in concert to give the greatest efficiency. Physicians must establish and maintain their clinic protocols and schedules in cooperation with a patient appointing system that can be responsive to fill the needs of both patient and physician. Patients likewise must respect and properly utilize the appointment time allotted to them, for they have a duty to arrive timely and cooperate in their care. Space must be adequate to allow the physician and his ancillary staff to screen, prepare and examine the patient as the encounter proceeds. Sufficient waiting, examination and treatment rooms must be at hand to accommodate patients and reduce queing as much as possible. The staff who assists and prepares the

patient, the paperwork and the rooms must likewise be competent to insure a smooth flow and timely intervention for each encounter that takes place. The proper tools, equipment and diagnostic means must be available to each physician to complete his evaluation during the encounter. All of these are ideals for which to strive, and each has an impact on the total encounter time. This study only addressed provider encounter time.

Patient satisfaction is tied to quality of care and physician productivity (Rosenblat, et al., 1982). The patient's satisfaction was not an element of this analysis, but properly, should be considered in any future such studies. It is not unusual that the patient presents with not just one, but more than one complaint which he/she needs addressed. This obviously impacts on encounter time and reflects the more demanding and better informed patient population that our progressive country has produced. This study only took into consideration primary diagnoses and the time associated with that singular episode of care.

Fort Campbell was the only site to record 60 and 90 minute visits. If these are reflective of an uncomplicated visit, these could be considered outlier values and have possibly skewed the findings.

There were also no reliable records available to study that described physician-staff interactions. Both sites reported fully authorized Table of Distribution and Allowances staffing to complete their health care mission. If any interpersonal or parochial bad feelings or lack of cooperation existed, it was not evident to this investigator.

Finally, sufficient funding was provided by Health Services Command to each facility for patient care. No lack of equipment or space to accommodate patient flow was reported. These were not then considered contributory to the differences in encounter times observed.

TABLE 5.

Steps in the Multiple Regression Analysis.

Dependent variable: TIME

| Step 1. Variable entered: | | SITE | | | |
|---------------------------|--------|----------------------|------|------------|--------------------|
| Multiple R | 0.3157 | Analysis of variance | DF | SS | |
| R-Square | 0.0997 | Source | | | |
| Adjusted R-Square | 0.0994 | Regression | 1 | 1414/.102 | MSS 14147.102 |
| Standard Error | 6.5838 | Residual | 2948 | 127783.403 | F 326.378 P 0.0000 |
| | | | | | MSS 43.326 |

Variables in the model:

| Variable | B | Beta | Std. Error | F-to-Remove | P-Value |
|----------|----------|----------|------------|-------------|---------|
| SITE | -4.46884 | -0.31572 | 0.24736 | 326.378 | 0.0000 |
| Constant | 19.15158 | | | | |

Step 2. Variable entered:

| | | Diagnosis Code V655 | | | |
|-------------------|--------|----------------------|------|------------|--------------------|
| Multiple R | 0.3789 | Analysis of variance | DF | SS | |
| R-Square | 0.1435 | Source | | | |
| Adjusted R-Square | 0.1430 | Regression | 2 | 20373.550 | MSS 10186.775 |
| Standard Error | 6.4224 | Residual | 2947 | 121556.956 | F 246.966 P 0.0000 |
| | | | | | MSS 41.248 |

Variables in the model:

| Variable | B | Beta | Std. Error | F-to-Remove | P-Value |
|----------|----------|----------|------------|-------------|---------|
| SITE | -5.34346 | -0.37751 | 0.25158 | 451.109 | 0.0000 |
| V655 | -4.54724 | -0.21838 | 0.37011 | 150.953 | 0.0000 |
| Constant | 20.08006 | | | | |

TABLE 5 (Continued)

| Dependent variable: TIME | | | | | | |
|---------------------------|----------|----------------------|------------|-------------|----------|--------|
| Step 3. Variable entered: | | Diagnosis Code 000 | | | | |
| Multiple R | 0.4067 | Analysis of variance | | | | P |
| R-Square | 0.1654 | Source | DF | SS | MSS | |
| Adjusted R-Square | 0.1645 | Regression | 3 | 23411.252 | 7823.751 | 0.0000 |
| Standard Error: | 6.3412 | Residual | 2946 | 118459.253 | 40.210 | |
| Variables in the model: | | | | | | |
| Variable | B | Beta | Std. Error | F-to-Remove | P-Value | |
| SITE | -5.00692 | -0.35373 | 0.25134 | 326.839 | 0.0000 | |
| V655 | -4.20843 | -0.20210 | 0.36746 | 131.168 | 0.0000 | |
| 000 | 6.39679 | 0.14979 | 0.12877 | 77.038 | 0.0000 | |
| Constant | 19.72869 | | | | | |
| Step 4: Variable entered: | | Diagnosis Code /821 | | | | |
| Multiple R | 0.4174 | Analysis of variance | | | | P |
| R-Square | 0.1743 | Source | DF | SS | MSS | |
| Adjusted R Square | 0.1731 | Regression | 4 | 24732.813 | 6183.203 | 0.0000 |
| Standard Error | 6.3084 | Residual | 2945 | 117197.693 | 39.795 | |
| Variables in the model: | | | | | | |
| Variable | B | Beta | Std. Error | F-to-Remove | P-Value | |
| SITE | -4.98287 | -0.35203 | 0.25008 | 397.016 | 0.0000 | |
| V655 | -4.25407 | -0.20430 | 0.36565 | 135.359 | 0.0000 | |
| 000 | 6.35114 | 0.14873 | 0.72505 | 76.731 | 0.0000 | |
| 7821 | -1.07439 | -0.09434 | 0.19082 | 31.701 | 0.0000 | |
| Constant | 19.77343 | | | | | |

TABLE 5 (Continued)

| | | | | | | | |
|---------------------------------|----------|----------------------|------------|-------------|---------|----------|----------------|
| Step 5. Variable entered: 37230 | | | | | | | |
| Multiple R | 0.4248 | Analysis of variance | | | | | |
| R-Square | 0.1804 | Source | DF | SS | | | |
| Adjusted R-Square | 0.1790 | Regression | 5 | 25607.420 | | | |
| Standard Error | 6.2859 | Residual | 2944 | 116323.086 | MSS | 5121.484 | F |
| | | | | | | 39.512 | 129.619 0.0000 |
| Variables in the model: | | | | | | | |
| Variable | B | Beta | Std. Error | F-to-Remove | P-Value | | |
| SITE | -4.76419 | -0.33658 | 0.25348 | 353.248 | 0.0000 | | |
| V655 | -4.26540 | -0.20484 | 0.36435 | 137.052 | 0.0000 | | |
| 000 | 6.34251 | 0.14852 | 0.72246 | 77.072 | 0.0000 | | |
| 7821 | -1.08968 | -0.09568 | 0.19017 | 32.834 | 0.0000 | | |
| 37230 | -3.57405 | -0.08005 | 0.75966 | 22.155 | 0.0000 | | |
| Constant | 19.77660 | | | | | | |
| Step 7. Variable entered: 7231 | | | | | | | |
| Multiple R | 0.4318 | Analysis of variance | | | | | |
| R-Square | 0.1864 | Source | DF | SS | | | |
| Adjusted R-Square | 0.1845 | Regression | / | 26462.142 | | | |
| Standard Error | 6.2648 | Residual | 2942 | 115468.364 | MSS | 3780.306 | F |
| | | | | | | 39.248 | 96.318 0.0000 |
| Variables in the model: | | | | | | | |
| Variable | B | Beta | Std. Error | F-to-Remove | P-Value | | |
| SITE | -4.46702 | -0.31559 | 0.26209 | 290.495 | 0.0000 | | |
| V655 | -4.04185 | -0.19410 | 0.36986 | 119.424 | 0.0000 | | |
| 000 | 6.56973 | 0.15385 | 0.72354 | 82.446 | 0.0000 | | |
| 7821 | -1.08221 | -0.09502 | 0.18959 | 32.584 | 0.0000 | | |
| 37230 | -3.63657 | -0.08145 | 0.75762 | 23.040 | 0.0000 | | |
| 7194 | -4.59874 | -0.05574 | 1.38033 | 11.100 | 0.0009 | | |
| 7231 | 1.44304 | 0.05633 | 0.44420 | 10.554 | 0.0012 | | |
| Constant | 19.54195 | | | | | | |

TABLE 5 (Continued)

| Step 8. Variable entered: 3820 | | Analysis of variance | | MSS | F | P |
|--------------------------------|----------|----------------------|------------|-------------|----------|--------|
| Multiple R | 0.4345 | Source | DF | | | |
| R-Square | 0.1888 | Regression | 8 | 26797.952 | 3349.114 | 0.0000 |
| Adjusted R-Square | 0.1866 | Residual | 2941 | 115132.554 | 39.147 | |
| Standard Error | 6.2568 | | | | | |
| Variables in the model: | | | | | | |
| Variable | B | Beta | Std. Error | F-to-Remove | P-Value | |
| SITE | -4.17099 | -0.29467 | 0.28059 | 220.974 | 0.0000 | |
| V655 | -4.06204 | -0.19507 | 0.36945 | 120.889 | 0.0000 | |
| 000 | 6.55318 | 0.15346 | 0.72263 | 82.238 | 0.0000 | |
| 7821 | -1.10347 | -0.09689 | 0.18948 | 33.915 | 0.0000 | |
| 37230 | -3.94174 | -0.08828 | 0.76378 | 26.634 | 0.0000 | |
| 7194 | -4.90391 | -0.05944 | 1.38248 | 12.582 | 0.0004 | |
| 7231 | 1.41374 | 0.05519 | 0.44374 | 10.150 | 0.0015 | |
| 3820 | -1.32387 | -0.05306 | 0.45201 | 8.578 | 0.0034 | |
| Constant | 19.55109 | | | | | |
| Constant | 19.15158 | | | | | |

TABLE 5 (Continued)

| Step 9. | Variable entered: | 401 | | | | |
|-------------------|-------------------|----------------------|------|------------|----------|--------|
| Multiple R | 0.4368 | Analysis of variance | DF | SS | MSS | P |
| R-Square | 0.1908 | Source | 9 | 27081.548 | 3009.061 | 0.0000 |
| Adjusted R-Square | 0.1883 | Regression | 2940 | 114848.957 | 39.064 | |
| Standard Error | 6.2501 | Residual | | | | |

| Variables in the model: | | | | | | |
|-------------------------|----------|----------|------------|-------------|---------|--|
| Variable | B | Beta | Std. Error | F-to-Remove | P-Value | |
| SITE | -4.00865 | -0.28320 | 0.28669 | 195.508 | 0.0000 | |
| V655 | -3.89883 | -0.18724 | 0.37399 | 108.679 | 0.0000 | |
| 000 | 6.71840 | 0.15733 | 0.72446 | 86.000 | 0.0000 | |
| 7821 | -1.09453 | -0.09611 | 0.18931 | 33.428 | 0.0000 | |
| 37230 | -3.93481 | -0.08813 | 0.76298 | 26.597 | 0.0000 | |
| 7194 | -4.89697 | -0.05935 | 1.38102 | 12.574 | 0.0004 | |
| 7231 | 1.57196 | 0.06136 | 0.44714 | 12.359 | 0.0005 | |
| 3820 | -1.31694 | -0.05278 | 0.45154 | 8.506 | 0.0036 | |
| 401 | 1.64382 | 0.04625 | 0.61009 | 7.260 | 0.0071 | |
| Constant | 19.38182 | | | | | |

TABLE 5 (Continued)

| Step 10. Variable entered: 3814 | | Analysis of variance | | | | F | P |
|---------------------------------|--------|----------------------|------|------------|----------|--------|--------|
| Multiple R | 0.4388 | Source | DF | SS | MSS | | |
| R-Square | 0.1926 | Regression | 10 | 27333.008 | 2733.301 | 10.099 | 0.0000 |
| Adjusted R-Square | 0.1898 | Residual | 2939 | 114597.497 | 38.992 | | |
| Standard Error | 6.2444 | | | | | | |

| Variables in the model: | | | | | P-Value |
|-------------------------|----------|----------|------------|-------------|---------|
| Variable | B | Beta | Std. Error | F-to-Remove | |
| SITE | -3.86188 | -0.27283 | 0.29220 | 174.677 | 0.0000 |
| V655 | -3.90991 | -0.18777 | 0.37367 | 109.485 | 0.0000 |
| 000 | 6.70913 | 0.15711 | 0.72380 | 85.920 | 0.0000 |
| 7821 | -1.07689 | -0.09456 | 0.18926 | 32.375 | 0.0000 |
| 37230 | -4.08718 | -0.09154 | 0.76463 | 28.573 | 0.0000 |
| 7194 | -5.04935 | -0.06120 | 1.38104 | 13.368 | 0.0003 |
| 7231 | 1.55637 | 0.06076 | 0.44677 | 12.136 | 0.0005 |
| 3820 | -1.46931 | -0.05889 | 0.45510 | 10.424 | 0.0013 |
| 401 | 1.63823 | 0.04609 | 0.60953 | 7.224 | 0.0072 |
| 3814 | -2.07647 | -0.04328 | 0.81767 | 6.449 | 0.0111 |
| Constant | 19.38742 | | | | |

TABLE 5 (Continued)

| Step 11. Variable entered: | | Analysis of variance | | | | F | P |
|----------------------------|----------|----------------------|------------|-------------|----------|--------|--------|
| Multiple R | 0.4402 | Source | DF | SS | MSS | | |
| R-Square | 0.1938 | Regression | 11 | 2/504.845 | 2500.440 | 64.201 | 0.0000 |
| Adjusted R-Square | 0.1908 | Residual | 2938 | 114425.661 | 38.947 | | |
| Standard Error | 6.2407 | | | | | | |
| Variables in the model: | | | | | | | |
| Variable | B | Beta | Std. Error | F-to-Remove | P-Value | | |
| SITE | -3.77181 | -0.26647 | 0.29516 | 163.297 | 0.0000 | | |
| V655 | -3.81902 | -0.18340 | 0.37595 | 103.190 | 0.0000 | | |
| 000 | 6.80113 | 0.15926 | 0.72471 | 88.072 | 0.0000 | | |
| 7821 | -1.07195 | -0.09412 | 0.18917 | 32.111 | 0.0000 | | |
| 37230 | -4.08300 | -0.09145 | 0.76419 | 28.547 | 0.0000 | | |
| 7194 | -5.04516 | -0.06115 | 1.38024 | 13.361 | 0.0003 | | |
| 7231 | 1.64449 | 0.06420 | 0.44848 | 13.446 | 0.0003 | | |
| 3820 | -1.46513 | -0.05872 | 0.45484 | 10.376 | 0.0013 | | |
| 401 | 1.73248 | 0.04875 | 0.61083 | 8.044 | 0.0046 | | |
| 3814 | -2.07203 | -0.04319 | 0.81720 | 6.429 | 0.0013 | | |
| 250 | 1.88331 | 0.03539 | 0.89660 | 4.412 | 0.0358 | | |
| Constant | 19.29316 | | | | | | |

TABLE 5 (Continued)

| Step 12. Variable entered: 462 | | Analysis of variance | | | |
|--------------------------------|--------|----------------------|------|------------|--------|
| Multiple R | 0.4413 | Source | DF | SS | |
| R-Square | 0.1947 | Regression | 12 | 27638.530 | |
| Adjusted R-Square | 0.1914 | Residual | 2937 | 114291.975 | |
| Standard Error | 6.2382 | | | | |
| | | | | MSS | F |
| | | | | 2303.211 | 59.186 |
| | | | | 38.915 | 0.0000 |

Variables in the model:

| Variable | B | Beta | Std. Error | F-to-Remove | P-Value |
|----------|----------|----------|------------|-------------|---------|
| SITE | -3.86942 | -0.27337 | 0.29970 | 166.690 | 0.0000 |
| V655 | -3.91752 | -0.18813 | 0.37954 | 106.541 | 0.0000 |
| Q00 | 6.70143 | 0.15693 | 0.72640 | 85.110 | 0.0000 |
| 7821 | -1.07730 | -0.09459 | 0.18911 | 32.452 | 0.0000 |
| 37230 | -4.08753 | -0.09155 | 0.76387 | 28.634 | 0.0000 |
| 7194 | -5.04970 | -0.06120 | 1.37967 | 13.396 | 0.0003 |
| 7231 | 1.54899 | 0.05047 | 0.45124 | 11.784 | 0.0006 |
| 3820 | -1.46966 | -0.05890 | 0.45465 | 10.449 | 0.0013 |
| 401 | 1.63033 | 0.04587 | 0.61306 | 7.072 | 0.0079 |
| 3814 | -2.07684 | -0.04329 | 0.81686 | 6.464 | 0.0110 |
| 250 | 1.78116 | 0.03347 | 0.89792 | 3.935 | 0.0474 |
| 462 | -1.45413 | -0.03146 | 0.78454 | 3.435 | 0.0639 |
| Constant | 19.39531 | | | | |

TABLE 5 (Continued)

| Step 13. Multiple R | Variable entered: | | Analysis of variance | | MSS | F | P |
|-------------------------|-------------------|------------|----------------------|-------------|----------|--------|--------|
| | 0.4422 | Source | DF | SS | | | |
| R-Square | 0.1956 | Regression | 13 | 27755.294 | 2135.023 | 54.902 | 0.0000 |
| Adjusted R-Square | 0.1920 | Residual | 2936 | 114175.211 | 38.888 | | |
| Standard Error | 6.2360 | | | | | | |
| Variables in the model: | | | | | | | |
| Variable | B | Beta | Std. Error | F-to-Remove | P-Value | | |
| SITE | -3.94705 | -0.27885 | 0.30293 | 269.768 | 0.0000 | | |
| V655 | -3.91104 | -0.18782 | 0.37943 | 106.251 | 0.0000 | | |
| 000 | 6.70694 | 0.15706 | 0.72616 | 85.307 | 0.0000 | | |
| 7821 | -1.15956 | -0.10182 | 0.19492 | 35.391 | 0.0000 | | |
| 37230 | -4.00632 | -0.08973 | 0.76505 | 27.423 | 0.0000 | | |
| 7194 | -4.96849 | -0.06022 | 1.38000 | 12.963 | 0.0003 | | |
| 7231 | 1.55785 | 0.06081 | 0.45112 | 11.925 | 0.0006 | | |
| 3820 | -1.38846 | -0.05565 | 0.45692 | 9.234 | 0.0024 | | |
| 401 | 1.63391 | 0.04597 | 0.61285 | 7.108 | 0.0077 | | |
| 3814 | -2.00490 | -0.04179 | 0.81764 | 6.013 | 0.0142 | | |
| 250 | 1.78474 | 0.03354 | 0.89762 | 3.953 | 0.0469 | | |
| 462 | -1.45056 | -0.03138 | 0.78428 | 3.421 | 0.0645 | | |
| 7840 | 1.73997 | 0.03006 | 1.00414 | 3.003 | 0.0832 | | |
| Constant | 19.39173 | | | | | | |

TABLE 5 (Continued)

| Step 14. | Variable entered: | V22 | Analysis of variance | | | | F | F |
|-------------------|-------------------|-----|----------------------|------|------------|----------|--------|--------|
| Multiple R | 0.4427 | | Source | DF | SS | MSS | | |
| R-Square | 0.1959 | | Regression | 14 | 27811.002 | 1986.500 | 51.090 | 0.0000 |
| Adjusted R-Square | 0.1921 | | Residual | 2935 | 114119.504 | 38.882 | | |
| Standard Error | 6.2356 | | | | | | | |

Variables in the model:

| Variable | B | Beta | Std. Error | F-to-Remove | P-Value |
|----------|----------|----------|------------|-------------|---------|
| SITE | -4.33339 | -0.30615 | 0.44264 | 95.841 | 0.0000 |
| V655 | -3.87517 | -0.18610 | 0.38058 | 103.679 | 0.0000 |
| 000 | 6.73805 | 0.15779 | 0.72657 | 86.003 | 0.0000 |
| 7821 | -1.15432 | -0.10136 | 0.19495 | 35.059 | 0.0000 |
| 37230 | -3.59854 | -0.08060 | 0.83742 | 18.466 | 0.0000 |
| 7194 | -4.56070 | -0.05528 | 1.42133 | 10.296 | 0.0014 |
| 7231 | 1.60560 | 0.06268 | 0.45284 | 12.571 | 0.0004 |
| 3820 | -0.98067 | -0.03930 | 0.56991 | 2.961 | 0.0854 |
| 401 | 1.65535 | 0.04658 | 0.61307 | 7.291 | 0.0070 |
| 3814 | -1.61028 | -0.03356 | 0.88155 | 3.337 | 0.0679 |
| 250 | 1.80618 | 0.03394 | 0.89773 | 4.048 | 0.0443 |
| 462 | -1.42911 | -0.03092 | 0.78443 | 3.319 | 0.0686 |
| 7840 | 2.10491 | 0.03637 | 1.04934 | 4.024 | 0.0449 |
| V22 | 0.58288 | 0.03217 | 0.48696 | 1.433 | 0.2314 |
| Constant | 19.37029 | | | | |

TABLE 5 (Continued)

| Step 15. Variable entered: V202 | | Analysis of variance | | | | F | P |
|---------------------------------|--------|----------------------|------|------------|----------|--------|--------|
| Multiple R | 0.4432 | Source | DF | SS | MSS | | |
| R-Square | 0.1964 | Regression | 15 | 27873.717 | 1858.248 | 47.802 | 0.0000 |
| Adjusted R-Square | 0.1923 | Residual | 2934 | 114056.789 | 38.874 | | |
| Standard Error | 6.2349 | | | | | | |

Variables in the model:

| Variable | B | Beta | Std. Error | F-to-Remove | P-Value |
|----------|----------|----------|------------|-------------|---------|
| SITE | -4.29042 | -0.30311 | 0.44389 | 93.423 | 0.0000 |
| V655 | -3.79560 | -0.18228 | 0.38566 | 96.861 | 0.0000 |
| 000 | 6.81815 | 0.15966 | 0.72923 | 87.419 | 0.0000 |
| 7821 | -1.14990 | -0.10097 | 0.19496 | 34.787 | 0.0000 |
| 37230 | -3.56034 | -0.07974 | 0.83788 | 18.056 | 0.0000 |
| 7194 | -4.52251 | -0.05482 | 1.42150 | 10.122 | 0.0015 |
| 7231 | 1.68365 | 0.06573 | 0.45697 | 13.578 | 0.0002 |
| 3820 | -0.94247 | -0.03777 | 0.57064 | 2.728 | 0.0987 |
| 401 | 1.73653 | 0.04886 | 0.61633 | 7.939 | 0.0049 |
| 3814 | -1.57301 | -0.03279 | 0.88194 | 3.181 | 0.0746 |
| 250 | 1.88736 | 0.03547 | 0.89991 | 4.399 | 0.0360 |
| 462 | -1.34794 | -0.02916 | 0.78694 | 2.934 | 0.0869 |
| 7840 | 2.13958 | 0.03697 | 1.04958 | 4.156 | 0.0416 |
| V22 | 0.62181 | 0.03431 | 0.48787 | 1.624 | 0.2026 |
| V202 | 0.89394 | 0.02168 | 0.70381 | 1.613 | 0.2041 |
| Constant | 19.28911 | | | | |

Variables not in the model:

| SITE | CODE | Partial Correlation | Tolerance | F-to-enter |
|-------|------|---------------------|-----------|------------|
| VAR4 | V/00 | 0.00930 | 0.410 | 0.253 |
| VAR9 | 340 | 0.01375 | 0.932 | 0.554 |
| VAR11 | 460 | -0.01665 | 0.912 | 0.813 |
| VAR12 | 461 | -0.01638 | 0.940 | 0.787 |
| VAR22 | 7245 | -0.01417 | 0.923 | 0.589 |
| VAR25 | 7890 | 0.01432 | 0.661 | 0.602 |

III. CONCLUSION AND RECOMMENDATIONS

Use of the computer for the large number of data entries was essential to this study. There was a great deal of time lost to complete this analysis due to removal of the computer support and associated personnel with the discontinuance of ACDBS. The continued success of such studies is dependent in large part upon computer access. ACDBS project managers will continue to edit and correct deficiencies in the data base and in time, more reliable and meaningful data will emerge.

For the purpose of this study it was proposed that the data would assist in establishing a measure of clinical productivity among family practice physicians for specific diagnoses in outpatient treatment settings. This remains a valid and important objective in continued research on a wider scale and with proper data and access. Due to the wide disparity in data sets, the significant differences in mean encounter times by diagnosis categories and the impact of site upon the analysis, it must be submitted the best result of this study would be to propose individual standards. Individual standards by site would not answer the overshadowing concern that this would not be tolerated by AMEDD leadership. Certainly, some standards would apply universally in reporting encounter times for comparison purposes.

The reduction of n to include only the twenty most frequently observed diagnosis categories at only two sites may have precluded a more revealing study. Given several month's worth of data, a greater diversity

of sites and a dedicated computer operator/programmer, this could have eliminated the discrepancies of such a focused study. A large part of the problem may be due to the differing case loads at each site. Fort Folk had four times the patient load assigned to each of their family practice physician panels as did Fort Campbell. When demand is not otherwise discouraged, often the provider pushes him or herself to see all patients who present each day. Even the most reliable controls on access in a limited resources clinic environment do not preclude patients seeking care from walking into the clinic unannounced.

Questions yet unanswered include what environmental factors impact on provider productivity that were not captured in the model. Are there other historical or traditional values that were not apparent in the study, yet held by providers, that the data comparison was not successful? Newer, more comprehensive approaches to provider productivity studies may be able to take these effects into account through a provider survey, done before, during and after the data collection. The rapid increase in computer programs that can capture, analyze and predict on an on-line basis appears to be just over the horizon for many in the civilian sector. Most recently, relative value scales have become a means to focus on productivity and the resources utilized per episode of care. The narrow concentration in this study did not include other specialties which are primary care providers. Case mix analysis and cross comparison with internal medicine and pediatrics would have also proven revealing on a productivity level for the same diagnosis. It may yet have an impact on productivity

monitoring in the ambulatory care setting, but for the purposes of this study, there remains too much unanswered variation and too much variation attributable to individual site. To attempt to state an acceptable standard on the basis of this study is not possible.

APPENDIX A

CHARACTERISTICS, STRENGTHS AND WEAKNESSES
OF PUBLISHED PATIENT CLASSIFICATION SYSTEMS

PATIENT CLASSIFICATION AND DATA COLLECTION SYSTEMS

1. System: Diagnosis Related Groups

Developed at Yale University in New Haven, Connecticut, and under direction of Robert Feter, PhD, with a grant from the Health Care Financing Administration (HCFA), they have been revised using International Classification of Diseases 9-Coding Manual (ICD-9-CM). The use of ICD-9-CM codes as the basis of most systems is due to their proven ability and understandability by clinicians, and general wide use and applicability in health care. The ICD-9-CM DRG's start with 23 major diagnostic categories (MDCs) groupings based on organ systems, then each MDC is divided into several diagnosis related groups (DRGs). Originally intended as a tool for utilization review, DRGs were designed to be medically homogeneous patient groups in terms of length of inpatient stay. (Fetter, Shin, Freeman, Averill & Thompson, 1980)

DRGs present the following strengths:

- MDCs based on organ systems parallel medical practice specialties.
- DRGs are readily available and now widely used and tested.

Weaknesses of DRGs include:

- The ability of Length of Stay and charge data used in development of DRGs to reflect accurate hospital costs is questioned by hospitals.
- Severity or stage of illness is not explicitly considered.

- DRGs are based on historical data, i.e., a resource consumption pattern that did occur may not be indicative of what is occurring or what should occur.
- A DRG assigned at discharge of the patient, after treatment has been provided limits its usefulness as a tool for concurrent management.
- It is most useful in an inpatient setting.

2. System: Disease Staging

Developed by Dr. Joseph Gonella, Dean, Jefferson Medical College, Philadelphia, Pennsylvania, in conjunction with SysMetrics, Inc., Santa Barbara, California, used 23 physician consultants assisting in specification of the medical staging criteria. It was designed as a tool to evaluate quality of patient care by grouping patients in accordance with similar disease-specific severity.

Disease Staging begins with 418 disease categories to describe hospitalized patients, and separates each disease category into four stages of increasing severity from no complications through death. Specific parameters apply to each stage of the disease category, and each substage. (Gonnella, 1983)

Disease Staging presents the following strengths:

- Pre-existing data from medical record abstracts can be used for computerized staging, or more detailed clinical data can be used for manual staging.

- Disease Staging groups are medically meaningful, organized in a fashion familiar to physicians.
- Disease-specific, severity-adjusted groups are homogenous in terms of clinical characteristics and may be useful in defining expected treatment patterns.

Weaknesses of Disease Staging Systems include:

- A disease specific measure of severity is more difficult to integrate with other systems than a generic severity system.
- The computerized version had to trade off some accuracy due to ICD-9-CM limitations which result in occasional understatement of staging.
- The system relates again to inpatient rather than outpatient care.

3. System: Severity of Illness Index

Research was conducted by Susan D. Horn, PhD, Associate Professor, Center for Hospital Finance and Management, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Maryland, funded in part by HCFA and Pew Memorial Trust and the John A. Hartford Foundation. The Severity of Illness Index is a generic (not disease specific) measure of patient severity based on assessment of the total burden of illness of a patient presenting to the hospital. The index is useful in predicting patient resource use as defined by length of stay and charges. The system may be integrated into DRGs and other disease-specific patient

grouping systems, but is assigned manually. It has been used to explain variances in physician practice patterns by examining the severity level of patients treated. (Horn, Chachich and Clapton, 1983)

The Severity of Illness Index is noted for these strengths:

- The system is independent of pre-existing abstract data based on diagnosis.
- As a diagnosis-independent system, it may be easily integrated with other pre-existing case mix systems such as DRGs.

Major weakness include:

- Its methodology makes it a tool specifically applicable to inpatient studies, and unsuitable for use in the ambulatory area.
- Scoring may be too subjective, relying on a rater assessing all seven available variances and also determining an overall score.
- The variable of "dependency on hospital staff" and "extent of non-operating room procedures" may be criticized as circular logic.
- Completion of a separate analysis and work sheet on each patient adds a function to chart completion and may make it expensive and time consuming.

4. System: Medical Illness Severity Grouping System (MEDISGRPS)

Dr. Alan C. Brewster, St. Vincent Hospital, Worcester, Massachusetts originated the concept of MEDISGRPS with MediQual Systems, Inc., a software company in Westborough, Massachusetts, and Chicago, Illinois. MEDISGRPS are diagnosis-independent severity groupings, based on evaluation of objective clinical findings and are designed to facilitate measurement of the effectiveness of hospital and physician services by controlling for initial severity. The system groups patients according to severity of admitting clinical findings or injury (Review 1) and may also be used to evaluate severity again as the hospital stay proceeds (Review 2).

MediQual asserts that the system assists the health care consumers in identifying effective and efficient providers. It may also serve as a medical abstract system when used concurrently. Each clinical finding has a predetermined weight on its expected relationship to increasing or advanced illness. (Brewster, Jacobs & Bradbury, 1984)

Relative strengths of MEDISGRPS include:

- Objectivity is based on actual test results rather than on a scorer's assessment of the medical record.
- The severity score determined at admission measures severity of condition, not adequacy or inadequacy of hospital treatment.
- Data entered at specific points during stay can be compared with admission data. Practice patterns can be analyzed preliminarily without returning to the medical record.

-- MEDISGRPS can be used to evaluate the clinical need for medical treatment provided, given the objective findings incorporated in the system.

-- MEDISGRPS may be integrated with DRGs.

Some weaknesses noted in MEDISGRPS are:

-- Positive results of tests prior to admission may not be entered into the system.

-- Required entry of data not routinely collected may be time consuming and expensive.

5. System: Patient Management Categories (PMCs)

The system was originally initiated by Blue Cross of western Pennsylvania, Pittsburgh, under the direction of Alanda Young, ScD, Vice President of Health Care Research, under a grant from HCFA. Panels of physician advisors were used to define patient categories and specify management strategies for each category. Cost data were collected from six western Pennsylvania hospitals and analyzed to develop relative cost weights for each Patient Management Category (PMC).

PMC's were developed to define patient types, or products, treated by hospitals and to identify the relative costs of producing those products. The system was designed for cost analysis and for use in hospital reimbursement.

PMC systems are computerized to be used with currently available hospital discharge abstract data. Work is in progress to extend the

PMC's to include ambulatory cases. Currently, 800 PMCs include specified typical management strategies for each category. (Young, 1984)

PMCs exhibit the following strengths:

- The PMC system is based on effective management strategies developed by a physician panel, not just on an average of actual treatment experience.
- Severity of illness distinctions are incorporated in the design and definitions of categories. Diagnosis sequencing (principle versus secondary) is irrelevant.
- Specific comorbid disease combinations are identified and cost-weight adjustments are made for increased resource use of patients with comorbid conditions.
- Cost, not charge, data are used to determine costs of care.
- Categorization software can be applied to any database compatible with Uniform Hospital Discharge Data Set (UHDDS).

Weakness of PMC:

- Only one PMC assignment is permitted within a disease or disorder group. Thus, the number of PMC assignments made is dependent on the definition of disease and disorder groups.
- The approximately 125 physicians from one geographical area (western Pennsylvania) who were involved in the development of the system may be considered too small a

group for establishing care components for diagnosis and treatment. This does not, however, affect the categorization, which may be used as a framework for subsequent analyses.

-- The large number of groups (800) may be cumbersome for management use. Many cells may be empty for smaller hospitals.

6. System: Diagnosis Clusters

Diagnosis clusters were developed at the University of Washington, Seattle, under the direction of Ronald Schneeweiss, MB. Research was funded by the Robert Wood Johnson Foundation.

Clusters were developed as a tool to facilitate comparison of ambulatory practice patterns across differing providers. They are intended to reduce the large number of individual diagnosis codes to a more manageable system of diagnosis clusters.

Diagnosis Clusters begin with diagnosis codes from any of a variety of coding schemes (International Classification of Diseases, ICDA-8, ICDA-9, ICD-9-CM, and also International Classification of Health Problems in Primary Care [ICHPHC, ICHPPC-2]). Related diagnosis codes are then aggregated into clusters. Clusters are determined with the purpose in mind of maintaining clinical consistency with clusters. Clusters were submitted to a panel of 15 physicians for review and modification. Data from a key study, the National Ambulatory Medical Care Survey (NAMCS) 1977 to 1978 and the University of Southern California Medical and Manpower study (USC/MAMP) 1977, were used in the

development process, to verify the frequency of occurrence of various diagnoses. Ninety-two clusters were formed, representing 86% of all diagnoses recorded in the NAMCS file. Fifteen clusters represented 50% of all diagnoses recorded. They provide an excellent framework for classification of ambulatory cases, although they are too broad for detailed comparative analysis. They are being used as the basis for revising the Ambulatory Patient Related Groups developed at Yale University and are likely to be used in the development of other similar systems. (Schneeweiss, et al., 1983)

Diagnosis clusters strengths:

- Diagnosis clusters provide a framework for additional analyses of ambulatory practice patterns.
- This system aggregates available codes, thereby creating a manageable number of groups.
- The impact of individual providers coding idiosyncracies reduces the aggregation of codes.
- Consumer groups could use the system to compare the cost and efficiency of ambulatory care across providers.
- The system can be used with a variety of diagnosis coding schemes.

Weaknesses of Diagnosis Clusters.

- Only diagnosis is taken into account, disregarding differences in patient demographics or required treatment (e.g., medical vs. surgical cases).
- Severity of illness is not accounted for.

- The group clusters may be too broad for accurate comparison of treatment patterns.
- Clusters are based on one diagnosis only. Multiple diagnoses are not accounted for.
- Clusters are not all-inclusive; the 92 clusters developed account for 86% of diagnoses recorded in the development database.

7. System: Ambulatory Patient Related Groups (APGs) [Now in their second generation, known as Ambulatory Visit Groups (AVGs).]

APGs were developed at Yale University under Robert B. Fetter, PhD, under a project funded by HCFA, the second HCFA grant is funding their revision. (Fetter, et al., 1984)

APGs were designed to classify ambulatory patients into homogeneous groups in terms of the patterns of services required for care, to facilitate comparative analysis of practice patterns across different providers. Revision is going to involve the use of Ambulatory Diagnosis Clusters, developed at the University of Washington, Seattle, as a base structure.

APGs are based on the DRG concept developed at Yale, and the revisions, when complete are likely to seriously interest government and third-party (private) payers as a method for ambulatory care payment. The second generation of APGs titled Ambulatory Visit Groups (AVGs) uses data collected from the 1979 NAMCS. AVGs meet most criteria for being a successful classification and data collection system.

Strengths of the APGs/AVGs:

- The system contains a manageable number of medically meaningful groups (19 major diagnostic categories similar to the format of DRGs and 5/1 groups) and encompasses ambulatory surgery and tertiary high technology specialties as well as ambulatory care are being evaluated now under the new AVG concept (Lion, et al., 1987).
- Designed with major physician input, AVGs seem to have clinical relevance and face validity.
- Clinically forward-looking, the AVGs have also allowed for groups for acquired immune deficiency syndrome (AIDS) and for certain high technology procedures, or continuous I.V. therapy among other areas which are shifting away from inpatient to outpatient settings.
- Although initially designed to measure resource costs in terms of physician time, they actually work much more comprehensively from a clinic point of view using total provider time or, optimally, total direct resource use associated with the visit.

Weaknesses noted for APGs/AVGs:

- Groupings have not yet been statistically examined for physician time as a management tool.

- There is a remaining difficulty in determining who is a new patient as opposed to a newly referred patient or an established patient.
- AVGs do not as yet allow for the more complicated patient, especially one with a secondary diagnosis (i.e., both hypertension and diabetes).

8. System: Ambulatory Care Data Base System (ACDBS)

The ACDB study was performed under the ambulatory portion of the Tri-Service Performance Measurement Study (PMS). The purpose of the PMS is to develop an alternative measure for military medical work units. Outpatient data was collected in over 70 clinical specialties at six medical facilities during a two-year period using optical mark sense technology and is stored in a central data base at Ft. Detrick, Maryland. A total of 3,108,741 patient encounters were captured. Forty-four clinic encounter variables include: diagnoses, procedures performed, time spent with patient, type of provider, place of visit. Fourteen patient demographic variables and seven health care provider variables were also captured. Reliability of data was verified by a manual review of data collected against the medical record entries for 9,015 patient encounters at six sites. Analysis of data will be covered in subsequent reports.

ACDBS System Strengths:

- Designed after review of previous efforts to examine ambulatory care data by civilian sources, and with

maximum physician input so as to have utmost clinical relevance.

- Using pencil-coded forms and automated scanning equipment, over three million total encounters were recorded for a substantial data base.
- Separate clinical specialties can be examined by extracting only data recorded for their patient recording form. Physicians can have a personal report by requesting a printout for their individual use.
- Provides valuable input for development of a military Management Information System (MIS) designated as the Composite Health Care System (CHCS).
- Major resources utilized in the individual encounter can be traced and a better resource allocation scheme composed of case mix and human resources management may be developed.
- Utilizes established ICD-9-CM and CPT-4 coding as a basis of comparison for accurate epidemiological data.

ACDBS System Weaknesses:

- Health care providers were asked to complete responses on diagnosis, procedures and time associated with the patient encounter. Frequently a provider failed for whatever reason to enter a pencil entry in the field for diagnosis or time. When the form was sent back for correction, often the NO PROBLEM NOTED option was marked,

negating the value of this diagnosis. Some forms likewise lacked coding for the time spent with patient.

- The primary care optical mark sense data collection form was a consolidation of diagnoses and procedures from the Emergency Room (ER), Troop Medical Clinic (TMC), the Acute Minor Illness Clinic (AMIC) and the Battalion Aid Station (BAS) making it a long, two page form, and somewhat cumbersome to fill out.

APPENDIX B

OUTPATIENT REGISTRATION FORM



OUTPATIENT REGISTRATION FORM

WELCOME!

The Army has started a system to automatically count patient visits and services. Please assist us by completing this form carefully - A SEPARATE FORM WILL BE FILLED OUT FOR EACH ELIGIBLE FAMILY MEMBER THE FIRST TIME THEY COME IN FOR TREATMENT. Use #2 pencil only and fill bubbles completely. Please write in both the appropriate number or letter and fill in the corresponding bubble (as shown in example below). The machine that reads this form only reads the bubbles. However, it is possible to make an error in marking bubbles. If this happens we can cross check and make corrections from your written entries. Carefully look at the example and then follow the arrows to each block and fill out both sides of the form completely.



EXAMPLE

DATE

| DAY | MONTH | YEAR |
|-----|-------|------|
| 02 | Jan | 85 |
| 03 | Feb | 00 |
| 04 | Mar | 01 |
| 05 | Apr | 02 |
| 06 | May | 03 |
| 07 | Jun | 04 |
| 08 | Jul | 05 |
| 09 | Aug | 06 |
| 10 | Sep | 07 |
| 11 | Oct | 08 |
| 12 | Nov | 09 |
| 13 | Dec | 10 |

WRITE →

If the date is Feb. 2, 1985, fill in the box as illustrated.

BUBBLE →

TODAY'S DATE

| DAY | MONTH | YEAR |
|-----|-------|------|
| 00 | Jan | 00 |
| 01 | Feb | 01 |
| 02 | Mar | 02 |
| 03 | Apr | 03 |
| 04 | May | 04 |
| 05 | Jun | 05 |
| 06 | Jul | 06 |
| 07 | Aug | 07 |
| 08 | Sep | 08 |
| 09 | Oct | 09 |
| 10 | Nov | 10 |
| 11 | Dec | 11 |

PATIENT'S BIRTHDATE

| DAY | MONTH | YEAR |
|-----|-------|------|
| 00 | Jan | 00 |
| 01 | Feb | 01 |
| 02 | Mar | 02 |
| 03 | Apr | 03 |
| 04 | May | 04 |
| 05 | Jun | 05 |
| 06 | Jul | 06 |
| 07 | Aug | 07 |
| 08 | Sep | 08 |
| 09 | Oct | 09 |
| 10 | Nov | 10 |
| 11 | Dec | 11 |

GENDER

☐ Male ☐ Female

RACE

☐ Am. Indian/Alaskan Native
☐ Asian/Pacific Islander
☐ Black/Not Hispanic Origin
☐ Black/Hispanic Origin
☐ White/Not Hispanic Origin
☐ White/Hispanic Origin
☐ Unknown

PRIVACY ACT STATEMENT - AMBULATORY CARE DATABASE

THIS FORM IS NOT A CONSENT FORM TO RELEASE OR USE HEALTH CARE INFORMATION PERTAINING TO YOU.

1. AUTHORITY FOR COLLECTION OF INFORMATION INCLUDING SOCIAL SECURITY NUMBER (SSN)

Sections 133, 1071-87, 3012, 5031 and 8012, title 10, United States Code, title 5, United States Code, and Executive Order 9397

2. PRINCIPAL PURPOSES FOR WHICH INFORMATION IS INTENDED TO BE USED

This form provides you the advice required by The Privacy Act of 1974. The personal information will facilitate and document your health care. The Social Security Number (SSN) of member or sponsor is required to identify and retrieve health care records.

3. ROUTINE USES

The primary use of this information is to provide, plan and coordinate health care. As prior to enactment of the Privacy Act, other possible uses are to: Aid in preventive health and communicable disease control programs and report medical conditions required by law to federal, state and local agencies; compile statistical data; conduct research; teach; determine suitability of persons for service or assignments; adjudicate claims and determine benefits; other lawful purposes, including law enforcement and litigation; conduct authorized investigations; evaluate care rendered; determine professional certification and hospital accreditation; provide physical qualifications of patients to agencies of federal, state, or local government upon request in the pursuit of their official duties.

4. WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION

In the case of military personnel, the requested information is mandatory because of the need to document all active duty medical incidents in view of future rights and benefits. In the case of all other personnel/beneficiaries, the requested information is voluntary. If the requested information is not furnished, comprehensive health care may not be possible, but CARE WILL NOT BE DENIED. Disclosure of Social Security Number (SSN) is mandatory.

This all inclusive Privacy Act Statement will apply to all requests for personal information made by health care treatment personnel or for medical/dental treatment purposes and will become a permanent part of your health care record.

Your signature merely acknowledges that you have been advised of the foregoing. If requested, a copy of this form will be furnished to you.

SIGNATURE OF PATIENT OR SPONSOR: _____

DATE: _____

PLEASE ANSWER QUESTIONS 1, 2, AND 3

1. Are you currently eligible for health care from the Veteran's Administration? ☐ Yes ☐ No ☐ Don't know

2. Do you currently have private health care insurance? ☐ Yes ☐ No

3. Are you currently a basic trainee or on TDY for less than 60 days? ☐ Yes ☐ No ☐ Not applicable

ZIP CODE

| | | | | |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 |
| 2 | 2 | 2 | 2 | 2 |
| 3 | 3 | 3 | 3 | 3 |
| 4 | 4 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 | 5 |
| 6 | 6 | 6 | 6 | 6 |
| 7 | 7 | 7 | 7 | 7 |
| 8 | 8 | 8 | 8 | 8 |
| 9 | 9 | 9 | 9 | 9 |

Write in your 5 digit zip code number and fill in the corresponding bubble of your current residence. If you live in BOQ, BEQ or barracks write in your unit zip code.

PLEASE TURN FORM OVER AND COMPLETE THE APPROPRIATE SECTIONS ON THE BACK

CAREFULLY READ THE INSTRUCTIONS FOR EACH OF THE THREE SECTIONS TO DETERMINE WHICH SECTIONS YOU ARE TO COMPLETE
REMEMBER: Write in the number or letter and fill in the corresponding bubble.

SECTION 1: EVERYONE MUST COMPLETE THIS SECTION

STATUS
MARK EACH STATUS BUBBLE THAT APPLIES TO YOU

- 1 Active Duty
- 2 Reserve-Initial Entry Trg
- 3 Reserve IDT/AT/ADT
- 4 NG Initial Entry Trg
- 5 NG IDT/AT/ADT
- 6 USMA Cadet
- 7 ROTC Cadet/Applicant
- 8 Depn Active Duty
- 9 Retired Service member
- 10 Depn Retired/Deceased

- 11 Civilian Employee
- 12 Civilian Employee in preemployment status

OR

- 13 None of the above (Ask clinic staff for help)

MARK ONE

| | |
|--|-------------------------------|
| SPONSOR'S BRANCH OF SERVICE | |
| <input type="radio"/> Army | <input type="radio"/> USAF |
| <input type="radio"/> Navy | <input type="radio"/> Marines |
| <input type="radio"/> Coast Guard | <input type="radio"/> USPHS |
| <input type="checkbox"/> Other (ask clinic staff for help) | |

| | |
|----------------------|---------------------|
| SERVICE PERSON'S SSN | |
| 0 0 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 0 0 |
| 1 1 1 1 1 1 1 1 1 1 | 2 2 2 2 2 2 2 2 2 2 |
| 3 3 3 3 3 3 3 3 3 3 | 4 4 4 4 4 4 4 4 4 4 |
| 5 5 5 5 5 5 5 5 5 5 | 6 6 6 6 6 6 6 6 6 6 |
| 7 7 7 7 7 7 7 7 7 7 | 8 8 8 8 8 8 8 8 8 8 |
| 9 9 9 9 9 9 9 9 9 9 | |

WRITE
BUBBLE

DEPENDENTS
DO NOT USE

DO YOU HAVE AN MOS/SSI?

YES NO
AND BUBBLE IN BELOW

CAREFULLY Waitlist
Officers require 3
numbers for MOS/SSI. . . .
Others place a zero (0)
before the 2 numbers of
your MOS/SSI.

| | |
|---------------------|---------------------|
| DUTY MOS/SSI | |
| 0 0 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 0 0 |
| 1 1 1 1 1 1 1 1 1 1 | 2 2 2 2 2 2 2 2 2 2 |
| 3 3 3 3 3 3 3 3 3 3 | 4 4 4 4 4 4 4 4 4 4 |
| 5 5 5 5 5 5 5 5 5 5 | 6 6 6 6 6 6 6 6 6 6 |
| 7 7 7 7 7 7 7 7 7 7 | 8 8 8 8 8 8 8 8 8 8 |
| 9 9 9 9 9 9 9 9 9 9 | |

| |
|------------------------|
| PAY GRADE |
| 0 1 2 3 4 5 6 7 8 9 10 |

SECTION 2: ONLY ARMY personnel
currently on AD or in
training.
(includes USAR and ARNG)

| | |
|---------------------|---------------------|
| UNIT ID CODE (UIC) | |
| 0 0 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 0 0 |
| 1 1 1 1 1 1 1 1 1 1 | 2 2 2 2 2 2 2 2 2 2 |
| 3 3 3 3 3 3 3 3 3 3 | 4 4 4 4 4 4 4 4 4 4 |
| 5 5 5 5 5 5 5 5 5 5 | 6 6 6 6 6 6 6 6 6 6 |
| 7 7 7 7 7 7 7 7 7 7 | 8 8 8 8 8 8 8 8 8 8 |
| 9 9 9 9 9 9 9 9 9 9 | |

SECTION 3: To be filled out by CIVILIAN employees and PREEMPLOYMENT CIVILIANS ONLY. This includes CIVILIAN employees and PREEMPLOYMENT or RETIREES.

YOUR RATING

- ☐ GS
- ☐ GM
- ☐ WG
- ☐ WL
- ☐ WS
- ☐ NAF
- ☐ Contract
- ☐ Other

PAY
GRADE

| | |
|---------------------|---------------------|
| 0 0 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 0 0 |
| 1 1 1 1 1 1 1 1 1 1 | 2 2 2 2 2 2 2 2 2 2 |
| 3 3 3 3 3 3 3 3 3 3 | 4 4 4 4 4 4 4 4 4 4 |
| 5 5 5 5 5 5 5 5 5 5 | 6 6 6 6 6 6 6 6 6 6 |
| 7 7 7 7 7 7 7 7 7 7 | 8 8 8 8 8 8 8 8 8 8 |
| 9 9 9 9 9 9 9 9 9 9 | |

CIVILIAN
OCC. SERIES

| | |
|---------------------|---------------------|
| 0 0 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 0 0 |
| 1 1 1 1 1 1 1 1 1 1 | 2 2 2 2 2 2 2 2 2 2 |
| 3 3 3 3 3 3 3 3 3 3 | 4 4 4 4 4 4 4 4 4 4 |
| 5 5 5 5 5 5 5 5 5 5 | 6 6 6 6 6 6 6 6 6 6 |
| 7 7 7 7 7 7 7 7 7 7 | 8 8 8 8 8 8 8 8 8 8 |
| 9 9 9 9 9 9 9 9 9 9 | |

BUILDING
NUMBER

| | |
|---------------------|---------------------|
| 0 0 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 0 0 |
| 1 1 1 1 1 1 1 1 1 1 | 2 2 2 2 2 2 2 2 2 2 |
| 3 3 3 3 3 3 3 3 3 3 | 4 4 4 4 4 4 4 4 4 4 |
| 5 5 5 5 5 5 5 5 5 5 | 6 6 6 6 6 6 6 6 6 6 |
| 7 7 7 7 7 7 7 7 7 7 | 8 8 8 8 8 8 8 8 8 8 |
| 9 9 9 9 9 9 9 9 9 9 | |

YOUR OWN SSN

| | |
|---------------------|---------------------|
| 0 0 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 0 0 |
| 1 1 1 1 1 1 1 1 1 1 | 2 2 2 2 2 2 2 2 2 2 |
| 3 3 3 3 3 3 3 3 3 3 | 4 4 4 4 4 4 4 4 4 4 |
| 5 5 5 5 5 5 5 5 5 5 | 6 6 6 6 6 6 6 6 6 6 |
| 7 7 7 7 7 7 7 7 7 7 | 8 8 8 8 8 8 8 8 8 8 |
| 9 9 9 9 9 9 9 9 9 9 | |

WRITE
BUBBLE

FOR STAFF
USE ONLY

| | |
|---------------------|---------------------|
| FMP | |
| 0 0 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 0 0 |
| 1 1 1 1 1 1 1 1 1 1 | 2 2 2 2 2 2 2 2 2 2 |
| 3 3 3 3 3 3 3 3 3 3 | 4 4 4 4 4 4 4 4 4 4 |
| 5 5 5 5 5 5 5 5 5 5 | 6 6 6 6 6 6 6 6 6 6 |
| 7 7 7 7 7 7 7 7 7 7 | 8 8 8 8 8 8 8 8 8 8 |
| 9 9 9 9 9 9 9 9 9 9 | |

| | |
|---------------------|---------------------|
| PATIENT CATEGORY | |
| 0 0 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 0 0 |
| 1 1 1 1 1 1 1 1 1 1 | 2 2 2 2 2 2 2 2 2 2 |
| 3 3 3 3 3 3 3 3 3 3 | 4 4 4 4 4 4 4 4 4 4 |
| 5 5 5 5 5 5 5 5 5 5 | 6 6 6 6 6 6 6 6 6 6 |
| 7 7 7 7 7 7 7 7 7 7 | 8 8 8 8 8 8 8 8 8 8 |
| 9 9 9 9 9 9 9 9 9 9 | |

| | |
|--------------------------|---------------------|
| FORTH COUNTRY CODE | |
| 0 0 0 0 0 0 0 0 0 0 | 0 0 0 0 0 0 0 0 0 0 |
| 1 1 1 1 1 1 1 1 1 1 | 2 2 2 2 2 2 2 2 2 2 |
| 3 3 3 3 3 3 3 3 3 3 | 4 4 4 4 4 4 4 4 4 4 |
| 5 5 5 5 5 5 5 5 5 5 | 6 6 6 6 6 6 6 6 6 6 |
| 7 7 7 7 7 7 7 7 7 7 | 8 8 8 8 8 8 8 8 8 8 |
| 9 9 9 9 9 9 9 9 9 9 | |

APPENDIX C

PROVIDER REGISTRATION FORM

- ## TYPE REPORT

WRITE

BUBBLE

TODAY'S DATE

| DAY | | MONTH | YEAR | |
|-----|---|-------|------|---|
| | | Jan | | |
| | | Feb | | |
| 0 | 0 | Mar | | 0 |
| 1 | 1 | Apr | | 1 |
| 2 | 2 | May | | 2 |
| 3 | 3 | Jun | | 3 |
| | 4 | Jul | | 4 |
| | 5 | Aug | | 5 |
| | 6 | Sep | | 6 |
| | 7 | Oct | | 7 |
| 8 | | Nov | 8 | 8 |
| 9 | | Dec | 9 | 9 |

CATEGORY

Officer
Warrant Officer
Enlisted
Civilian (DAC)
Contract
Consultant
Other

MILITARY

BRANCH OF SERVICE

Army
Air Force
Navy
Marines
Coast Guard
PHS
Other

| | |
|--------------|--|
| PAY GRADE | |
|--------------|--|

| | |
|---|---|
| E | 1 |
| | 2 |
| O | 3 |
| | 4 |
| W | 5 |
| | 6 |
| | 7 |
| | 8 |
| | 9 |

DA CIVILIAN

PAY
GRADE

**CIVILIAN
DCC SERIES**

| | |
|---|---|
| 0 | 0 |
| 1 | 1 |
| | 2 |
| | 3 |
| | 4 |
| | 5 |
| | 6 |
| | 7 |
| | 8 |
| | 9 |

LAST NAME**FIRST NAME**

SOCIAL SECURITY NO.

[illegible][illegible]**STATUS**

Permanent staff this MTF
All others

PROVIDER POSITION

| | |
|-----------------|--------------|
| CDR/DCCS | Nurse Pract. |
| Chief Dept./Svc | Nurse Clin. |
| Fellow | NCOIC |
| Resident | Student |
| Intern | All others |

MILITARY SPECIALTY DESIGNATOR

ARMY DUTY MOS

| SSI | | | | ASI | | | |
|-----|---|---|-------|-----|-------|-------|---|
| | | | | OFF | | ENL | |
| | | | | | | | |
| 0 | 0 | 0 | | 0 | | | 0 |
| 1 | 1 | 1 | A J S | 1 | A J S | A J S | 1 |
| 2 | 2 | 2 | B K T | 2 | B K T | B K T | 2 |
| 3 | 3 | 3 | C L U | 3 | C L U | C L U | 3 |
| 4 | 4 | 4 | D M V | 4 | D M V | D M V | 4 |
| 5 | 5 | 5 | E N W | 5 | E N W | E N W | 5 |
| 6 | 6 | 6 | F O X | 6 | F O X | F O X | 6 |
| 7 | 7 | 7 | G P Y | 7 | G P Y | G P Y | 7 |
| 8 | 8 | 8 | H Q Z | 8 | H Q Z | H Q Z | 8 |
| 9 | 9 | 9 | I R | 9 | I R | I R | 9 |

AIR FORCE AFSC

| | | | | | | | | |
|-------|---|---|---|---|---|-------|--|--|
| | | | | | | | | |
| A J B | 0 | 0 | 0 | 0 | 0 | A J B | | |
| B K T | 1 | 1 | 1 | 1 | 1 | B K T | | |
| C L U | 2 | 2 | 2 | 2 | 2 | C L U | | |
| D M V | 3 | 3 | 3 | 3 | 3 | D M V | | |
| E N W | 4 | 4 | 4 | 4 | 4 | E N W | | |
| F O X | 5 | 5 | 5 | 5 | 5 | F O X | | |
| G P Y | 6 | 6 | 6 | 6 | 6 | G P Y | | |
| H Q Z | 7 | 7 | 7 | 7 | 7 | H Q Z | | |
| I R | 8 | 8 | 8 | 8 | 8 | I R | | |

NAVY NOBC/NEC

| | | | | | |
|-------|---|---|---|---|-------|
| | | | | | |
| A J U | 0 | 0 | 0 | 0 | |
| B K T | 1 | 1 | 1 | 1 | A G R |
| C L U | 2 | 2 | 2 | 2 | B K Y |
| D M V | 3 | 3 | 3 | 3 | C L U |
| E N W | 4 | 4 | 4 | 4 | D M V |
| F O X | 5 | 5 | 5 | 5 | E N W |
| G P Y | 6 | 6 | 6 | 6 | F O X |
| H Q Z | 7 | 7 | 7 | 7 | G P Y |
| I R | 8 | 8 | 8 | 8 | H Q Z |
| J S | 9 | 9 | 9 | 9 | I R |

COMPLETE REVERSE SIDE


21934
 DO NOT MARK IN THIS AREA
 NCS Trans-Onto: EP01-21084:3 A6300 62

PRIVACY ACT STATEMENT AMBULATORY CARE DATA BASE

THIS FORM IS NOT A GENERAL CONSENT FOR RELEASE OF PERSONAL INFORMATION.

1. AUTHORITY FOR COLLECTION OF INFORMATION INCLUDING SOCIAL SECURITY NUMBER (SSN).

Sections 133, 1071-87, 3012, 5031, and 8012, title 10, United States Code, title 5, United States Code, and Executive Order 9397.

2. PRINCIPAL PURPOSES FOR WHICH THIS INFORMATION IS INTENDED TO BE USED.

The personal information will facilitate and document your health care accomplishments. The social security number (SSN) of each provider is required in order to interpret the provider codes on encounter forms. The other information is required for demographic and/or administrative purposes.

The data collected for this study will support a number of provider benefits: periodic summary reports to each provider, data for peer review, certification and retrospective chart audits, opportunities to document uncaptured workload, documentation of multi-provider encounters, and collection of UCA and MED 302 input from a single, common, and reliable source.

3. ROUTINE USES.

The primary use of this information is to provide, plan, and coordinate health care delivery. Possible uses of these ambulatory care data are in: conducting preventive health and communicable disease control programs, compiling statistical data, conducting research, teaching, conducting authorized clinical investigations, and determining eligibility for individual professional certification and hospital accreditation.

4. WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY.

In the case of military and civilian health care providers, the requested information, including SSN, is mandatory in order to document all ambulatory care encounters in this facility, as directed by OTSG.

Your signature merely acknowledges that you have been advised of the foregoing. If requested, a copy of this form will be furnished to you.

SIGNATURE: _____

DATE: _____

APPENDIX D

PRIMARY CARE PATIENT FORM

PRIMARY CARE PATIENT

PATIENT

| TODAY'S DATE | | |
|--------------|-------|------|
| DAY | MONTH | YEAR |
| 0 | 0 | 0 |
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 8 | 8 | 8 |
| 9 | 9 | 9 |

| SPONSOR'S SSN | | | | | | | | | |
|---------------|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |

| PATIENT INFORMATION | | | | |
|---------------------|-----------|-------|-----|-------|
| EMP | BIRTHDATE | | DAY | MONTH |
| | DAY | MONTH | | |
| 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 |
| 2 | 2 | 2 | 2 | 2 |
| 3 | 3 | 3 | 3 | 3 |
| 4 | 4 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 | 5 |
| 6 | 6 | 6 | 6 | 6 |
| 7 | 7 | 7 | 7 | 7 |
| 8 | 8 | 8 | 8 | 8 |
| 9 | 9 | 9 | 9 | 9 |

ADMINISTRATION

| CLINIC DATA | |
|-------------|----------------------------|
| CLINIC CODE | INPATIENT OR REFERRAL CODE |
| 0 | 0 |
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |
| 8 | 8 |
| 9 | 9 |

| PLACE OF VISIT | |
|----------------|---|
| 1 | 2 |
| 3 | 4 |
| 5 | 6 |
| 7 | 8 |
| 9 | 0 |

| APPOINTMENT STATUS | |
|--------------------|---|
| 1 | 2 |
| 3 | 4 |
| 5 | 6 |
| 7 | 8 |
| 9 | 0 |

| STATUS OF VISIT | |
|-----------------|---|
| 1 | 2 |
| 3 | 4 |
| 5 | 6 |
| 7 | 8 |
| 9 | 0 |

081024

INSTRUCTIONS AND PATIENTAL DISPOSITION

- 1. Patient to be seen at...
- 2. Patient to be seen at...
- 3. Patient to be seen at...
- 4. Patient to be seen at...
- 5. Patient to be seen at...
- 6. Patient to be seen at...
- 7. Patient to be seen at...
- 8. Patient to be seen at...
- 9. Patient to be seen at...
- 0. Patient to be seen at...

INSTRUCTIONS

- DO NOT use ink or ballpoint pen
- Make each mark heavy and black.
- Fill ovals completely
- Erase cleanly any mark you wish to change
- Make no stray marks.

ONLY ACCEPTABLE MARK
DO NOT MARK IN THIS AREA

APPENDIX B. PROOFS

GUI SYSTEM

RESPIRATORY

LEN

DIGESTIVE

FEMALE/CYN

| MARK ONE PRIMARY DIAGNOSIS OR REASON FOR VISIT AND ONE SECONDARY (IF APPLICABLE) | | | | | | | | | | | | | | | |
|--|--|------|--|--|--|------|--|--|--|------|--|--|--|--|--|
| Dx 1 | | Dx 2 | | Dx 1 | | Dx 2 | | Dx 1 | | Dx 2 | | | | | |
| ENDOCRINE, NUTRIT, METABOL | | | | HEALTHY PERSON | | | | OTHER TRAUMAS | | | | | | | |
| 10000 DIABETES MELLITUS 10001 DIABETES MELLITUS TYPE 1 10002 DIABETES MELLITUS TYPE 2 10003 DIABETES MELLITUS TYPE 3 10004 DIABETES MELLITUS TYPE 4 10005 DIABETES MELLITUS TYPE 5 10006 DIABETES MELLITUS TYPE 6 10007 DIABETES MELLITUS TYPE 7 10008 DIABETES MELLITUS TYPE 8 10009 DIABETES MELLITUS TYPE 9 10010 DIABETES MELLITUS TYPE 10 10011 DIABETES MELLITUS TYPE 11 10012 DIABETES MELLITUS TYPE 12 10013 DIABETES MELLITUS TYPE 13 10014 DIABETES MELLITUS TYPE 14 10015 DIABETES MELLITUS TYPE 15 10016 DIABETES MELLITUS TYPE 16 10017 DIABETES MELLITUS TYPE 17 10018 DIABETES MELLITUS TYPE 18 10019 DIABETES MELLITUS TYPE 19 10020 DIABETES MELLITUS TYPE 20 | | | | 10021 DIABETES MELLITUS TYPE 21 10022 DIABETES MELLITUS TYPE 22 10023 DIABETES MELLITUS TYPE 23 10024 DIABETES MELLITUS TYPE 24 10025 DIABETES MELLITUS TYPE 25 10026 DIABETES MELLITUS TYPE 26 10027 DIABETES MELLITUS TYPE 27 10028 DIABETES MELLITUS TYPE 28 10029 DIABETES MELLITUS TYPE 29 10030 DIABETES MELLITUS TYPE 30 10031 DIABETES MELLITUS TYPE 31 10032 DIABETES MELLITUS TYPE 32 10033 DIABETES MELLITUS TYPE 33 10034 DIABETES MELLITUS TYPE 34 10035 DIABETES MELLITUS TYPE 35 10036 DIABETES MELLITUS TYPE 36 10037 DIABETES MELLITUS TYPE 37 10038 DIABETES MELLITUS TYPE 38 10039 DIABETES MELLITUS TYPE 39 10040 DIABETES MELLITUS TYPE 40 | | | | 10041 DIABETES MELLITUS TYPE 41 10042 DIABETES MELLITUS TYPE 42 10043 DIABETES MELLITUS TYPE 43 10044 DIABETES MELLITUS TYPE 44 10045 DIABETES MELLITUS TYPE 45 10046 DIABETES MELLITUS TYPE 46 10047 DIABETES MELLITUS TYPE 47 10048 DIABETES MELLITUS TYPE 48 10049 DIABETES MELLITUS TYPE 49 10050 DIABETES MELLITUS TYPE 50 10051 DIABETES MELLITUS TYPE 51 10052 DIABETES MELLITUS TYPE 52 10053 DIABETES MELLITUS TYPE 53 10054 DIABETES MELLITUS TYPE 54 10055 DIABETES MELLITUS TYPE 55 10056 DIABETES MELLITUS TYPE 56 10057 DIABETES MELLITUS TYPE 57 10058 DIABETES MELLITUS TYPE 58 10059 DIABETES MELLITUS TYPE 59 10060 DIABETES MELLITUS TYPE 60 | | | | 10061 DIABETES MELLITUS TYPE 61 10062 DIABETES MELLITUS TYPE 62 10063 DIABETES MELLITUS TYPE 63 10064 DIABETES MELLITUS TYPE 64 10065 DIABETES MELLITUS TYPE 65 10066 DIABETES MELLITUS TYPE 66 10067 DIABETES MELLITUS TYPE 67 10068 DIABETES MELLITUS TYPE 68 10069 DIABETES MELLITUS TYPE 69 10070 DIABETES MELLITUS TYPE 70 10071 DIABETES MELLITUS TYPE 71 10072 DIABETES MELLITUS TYPE 72 10073 DIABETES MELLITUS TYPE 73 10074 DIABETES MELLITUS TYPE 74 10075 DIABETES MELLITUS TYPE 75 10076 DIABETES MELLITUS TYPE 76 10077 DIABETES MELLITUS TYPE 77 10078 DIABETES MELLITUS TYPE 78 10079 DIABETES MELLITUS TYPE 79 10080 DIABETES MELLITUS TYPE 80 | | | |
| SKIN & SUBCUTANEOUS | | | | HEALTHY PERSON | | | | OTHER TRAUMAS | | | | | | | |
| 10081 SKIN DISEASE 10082 SKIN DISEASE 10083 SKIN DISEASE 10084 SKIN DISEASE 10085 SKIN DISEASE 10086 SKIN DISEASE 10087 SKIN DISEASE 10088 SKIN DISEASE 10089 SKIN DISEASE 10090 SKIN DISEASE 10091 SKIN DISEASE 10092 SKIN DISEASE 10093 SKIN DISEASE 10094 SKIN DISEASE 10095 SKIN DISEASE 10096 SKIN DISEASE 10097 SKIN DISEASE 10098 SKIN DISEASE 10099 SKIN DISEASE 10100 SKIN DISEASE | | | | 10101 SKIN DISEASE 10102 SKIN DISEASE 10103 SKIN DISEASE 10104 SKIN DISEASE 10105 SKIN DISEASE 10106 SKIN DISEASE 10107 SKIN DISEASE 10108 SKIN DISEASE 10109 SKIN DISEASE 10110 SKIN DISEASE 10111 SKIN DISEASE 10112 SKIN DISEASE 10113 SKIN DISEASE 10114 SKIN DISEASE 10115 SKIN DISEASE 10116 SKIN DISEASE 10117 SKIN DISEASE 10118 SKIN DISEASE 10119 SKIN DISEASE 10120 SKIN DISEASE | | | | 10121 SKIN DISEASE 10122 SKIN DISEASE 10123 SKIN DISEASE 10124 SKIN DISEASE 10125 SKIN DISEASE 10126 SKIN DISEASE 10127 SKIN DISEASE 10128 SKIN DISEASE 10129 SKIN DISEASE 10130 SKIN DISEASE 10131 SKIN DISEASE 10132 SKIN DISEASE 10133 SKIN DISEASE 10134 SKIN DISEASE 10135 SKIN DISEASE 10136 SKIN DISEASE 10137 SKIN DISEASE 10138 SKIN DISEASE 10139 SKIN DISEASE 10140 SKIN DISEASE | | | | | | | |
| BLOOD | | | | GENERAL SIGNS & SYMPTOMS | | | | ADVERSE EFFECTS | | | | | | | |
| 10141 BLOOD DISEASE 10142 BLOOD DISEASE 10143 BLOOD DISEASE 10144 BLOOD DISEASE 10145 BLOOD DISEASE 10146 BLOOD DISEASE 10147 BLOOD DISEASE 10148 BLOOD DISEASE 10149 BLOOD DISEASE 10150 BLOOD DISEASE 10151 BLOOD DISEASE 10152 BLOOD DISEASE 10153 BLOOD DISEASE 10154 BLOOD DISEASE 10155 BLOOD DISEASE 10156 BLOOD DISEASE 10157 BLOOD DISEASE 10158 BLOOD DISEASE 10159 BLOOD DISEASE 10160 BLOOD DISEASE | | | | 10161 BLOOD DISEASE 10162 BLOOD DISEASE 10163 BLOOD DISEASE 10164 BLOOD DISEASE 10165 BLOOD DISEASE 10166 BLOOD DISEASE 10167 BLOOD DISEASE 10168 BLOOD DISEASE 10169 BLOOD DISEASE 10170 BLOOD DISEASE 10171 BLOOD DISEASE 10172 BLOOD DISEASE 10173 BLOOD DISEASE 10174 BLOOD DISEASE 10175 BLOOD DISEASE 10176 BLOOD DISEASE 10177 BLOOD DISEASE 10178 BLOOD DISEASE 10179 BLOOD DISEASE 10180 BLOOD DISEASE | | | | 10181 BLOOD DISEASE 10182 BLOOD DISEASE 10183 BLOOD DISEASE 10184 BLOOD DISEASE 10185 BLOOD DISEASE 10186 BLOOD DISEASE 10187 BLOOD DISEASE 10188 BLOOD DISEASE 10189 BLOOD DISEASE 10190 BLOOD DISEASE 10191 BLOOD DISEASE 10192 BLOOD DISEASE 10193 BLOOD DISEASE 10194 BLOOD DISEASE 10195 BLOOD DISEASE 10196 BLOOD DISEASE 10197 BLOOD DISEASE 10198 BLOOD DISEASE 10199 BLOOD DISEASE 10200 BLOOD DISEASE | | | | | | | |
| MS-CONNECTIVE | | | | ADVERSE EFFECTS | | | | SUP | | | | | | | |

APPENDIX E

T-TESTS OF MEAN ENCOUNTER TIMES PER DIAGNOSES

SUMMARY OF DESCRIPTIVE STATISTICS
AND t-Test

Dependent Variable: Time
Site: 0=Campbell
1=Polk

| <u>Diagnosis</u> | <u>Site</u> | <u>N</u> | <u>X</u> | <u>SD</u> | <u>Min</u> | <u>Max</u> |
|-------------------------|-------------|----------|----------|-----------|------------|------------|
| V22 | Campbell | 95 | 20.947 | 8.761 | 5 | 45 |
| | Polk | 448 | 15.379 | 5.069 | 5 | 30 |
| t(541) = 8.386, p .001 | | | | | | |
| V202 | Campbell | 37 | 20.541 | 8.481 | 10 | 45 |
| | Polk | 85 | 15.059 | 0.542 | 15 | 20 |
| t(120) = 19.035, p .001 | | | | | | |
| V655 | Campbell | 98 | 15.459 | 6.385 | 5 | 45 |
| | Polk | 319 | 13.793 | 4.366 | 5 | 30 |
| t(415) = 2.938, p .01 | | | | | | |
| V700 | Campbell | 156 | 19.135 | 4.723 | 5 | 45 |
| | Polk | 71 | 17.113 | 5.323 | 5 | 45 |
| t(225) = 2.872, p .01 | | | | | | |
| V7231 | Campbell | 80 | 20.875 | 8.743 | 5 | 60 |
| | Polk | 214 | 18.341 | 3.649 | 15 | 45 |
| t(292) = 3.510, p .001 | | | | | | |
| 000 | Campbell | 27 | 25.741 | 11.986 | 5 | 45 |
| | Polk | 54 | 12.870 | 6.340 | 5 | 30 |
| t(79) = 6.337, p .001 | | | | | | |
| 250 | Campbell | 17 | 21.176 | 6.257 | 15 | 30 |
| | Polk | 39 | 15.641 | 5.279 | 5 | 30 |
| t(54) = 3.408, p .01 | | | | | | |
| 340 | Campbell | 25 | 19.800 | 6.843 | 10 | 30 |
| | Polk | 49 | 14.796 | 5.099 | 5 | 30 |
| t(72) = 3.546, p .001 | | | | | | |

| <u>Diagnosis</u> | <u>Site</u> | <u>N</u> | <u>X</u> | <u>SD</u> | <u>Min</u> | <u>Max</u> |
|--------------------------------------|-------------|----------|----------|-----------|------------|------------|
| 401 | Campbell | 39 | 21.026 | 6.706 | 5 | 30 |
| | Polk | 99 | 15.657 | 3.823 | 5 | 20 |
| t(136) = 5.906, p .001 | | | | | | |
| 460 | Campbell | 32 | 18.750 | 7.931 | 10 | 45 |
| | Polk | 104 | 12.308 | 4.670 | 5 | 20 |
| t(134) = 5.696, p .001 | | | | | | |
| 461 | Campbell | 22 | 18.636 | 5.602 | 10 | 30 |
| | Polk | 34 | 15.735 | 6.412 | 5 | 45 |
| t(54) = 1.735, p .10 not significant | | | | | | |
| 462 | Campbell | 22 | 18.636 | 5.602 | 10 | 30 |
| | Polk | 64 | 13.047 | 5.951 | 5 | 45 |
| t(84) = 3.854, p .001 | | | | | | |
| 3814 | Campbell | 19 | 21.053 | 6.786 | 10 | 30 |
| | Polk | 42 | 13.690 | 3.503 | 5 | 20 |
| t(59) = 5.604, p .001 | | | | | | |
| 3820 | Campbell | 78 | 22.308 | 11.697 | 10 | 90 |
| | Polk | 164 | 13.811 | 3.626 | 5 | 20 |
| t(240) = 8.497, p .001 | | | | | | |
| 7104 | Campbell | 25 | 20.400 | 6.602 | 10 | 30 |
| | Polk | 31 | 13.710 | 5.769 | 5 | 30 |
| t(54) = 4.280, p .001 | | | | | | |
| 7245 | Campbell | 17 | 17.647 | 5.037 | 15 | 30 |
| | Polk | 39 | 15.256 | 3.234 | 5 | 20 |
| t(54) = 2.133, p .05 | | | | | | |
| 7821 | Campbell | 30 | 19.000 | 6.618 | 10 | 30 |
| | Polk | 60 | 13.750 | 4.838 | 5 | 30 |
| t(88) = 4.279, p .001 | | | | | | |

| <u>Diagnosis</u> | <u>Site</u> | <u>N</u> | <u>X</u> | <u>SD</u> | <u>Min</u> | <u>Max</u> |
|--------------------------------------|-------------|----------|----------|-----------|------------|------------|
| 7840 | Campbell | 17 | 20.294 | 7.998 | 5 | 30 |
| | Polk | 38 | 15.921 | 6.457 | 5 | 45 |
| t(53) = 2.154, p .05 | | | | | | |
| 7890 | Campbell | 24 | 18.333 | 9.168 | 15 | 60 |
| | Polk | 56 | 15.536 | 6.229 | 5 | 30 |
| t(78) = 1.587, p .20 not significant | | | | | | |
| 37230 | Campbell | 21 | 16.667 | 5.323 | 10 | 30 |
| | Polk | 42 | 12.381 | 4.585 | 5 | 20 |
| t(61) = 3.315, p .01 | | | | | | |

APPENDIX F

CORRELATION MATRIX

The P-values shown are 2 tailed values.

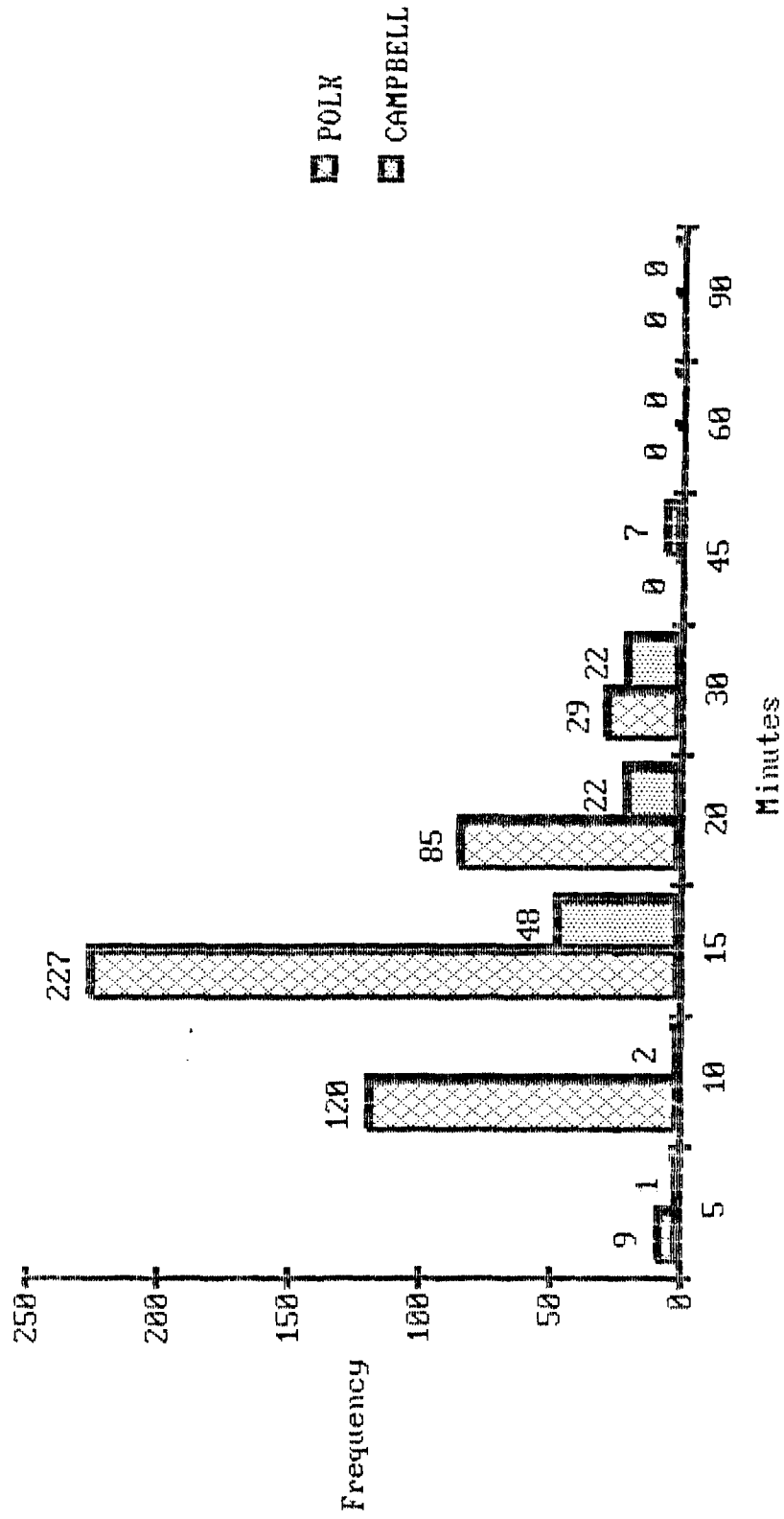
| | VAR1 | VAR2 | VAR3 | VAR4 | VAR6 | VAR7 | VAR8 | VAR9 | VAR10 | V. |
|-------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|-----|
| VAR1 | 1.0000 0.0000 (%2950) | -0.0987 0.0000 (%2950) | -0.1927 0.0000 (%2950) | -0.1371 0.0000 (%2950) | -0.1530 0.0000 (%2950) | -0.0798 0.0000 (%2950) | -0.0661 0.0000 (%2950) | -0.0762 0.0000 (%2950) | -0.1052 0.0000 (%2950) | -0. |
| VAR2 | -0.0987 0.0000 (%2950) | 1.0000 0.0000 (%2950) | -0.0843 0.0000 (%2950) | -0.0600 0.0011 (%2950) | -0.0691 0.0002 (%2950) | -0.0349 0.0581 (%2950) | -0.0289 0.1167 (%2950) | -0.0333 0.0704 (%2950) | -0.0460 0.0124 (%2950) | -0. |
| VAR3 | -0.1927 0.0000 (%2950) | -0.0843 0.0000 (%2950) | 1.0000 0.0000 (%2950) | -0.1171 0.0000 (%2950) | -0.1350 0.0000 (%2950) | -0.0682 0.0002 (%2950) | -0.0564 0.0022 (%2950) | -0.0651 0.0004 (%2950) | -0.0899 0.0000 (%2950) | -0. |
| VAR4 | -0.1371 0.0000 (%2950) | -0.0600 0.0011 (%2950) | -0.1171 0.0000 (%2950) | 1.0000 0.0000 (%2950) | -0.0961 0.0000 (%2950) | -0.0485 0.0084 (%2950) | -0.0402 0.0291 (%2950) | -0.0463 0.0119 (%2950) | -0.0640 0.0005 (%2950) | -0. |
| VAR6 | -0.1530 0.0000 (%2950) | -0.0691 0.0002 (%2950) | -0.1350 0.0000 (%2950) | -0.0961 0.0000 (%2950) | 1.0000 0.0000 (%2950) | -0.0559 0.0024 (%2950) | -0.0463 0.0119 (%2950) | -0.0534 0.0037 (%2950) | -0.0737 0.0001 (%2950) | -0. |
| VAR7 | -0.0798 0.0000 (%2950) | -0.0349 0.0581 (%2950) | -0.0682 0.0002 (%2950) | -0.0485 0.0084 (%2950) | -0.0559 0.0024 (%2950) | 1.0000 0.0000 (%2950) | -0.0234 0.2044 (%2950) | -0.0270 0.1433 (%2950) | -0.0372 0.0432 (%2950) | -0. |
| VAR8 | -0.0661 0.0003 (%2950) | -0.0289 0.1167 (%2950) | -0.0564 0.0022 (%2950) | -0.0402 0.0291 (%2950) | -0.0463 0.0119 (%2950) | -0.0234 0.2044 (%2950) | 1.0000 0.0000 (%2950) | -0.0223 0.2257 (%2950) | -0.0308 0.0942 (%2950) | -0. |
| VAR9 | -0.0762 0.0000 (%2950) | -0.0333 0.0704 (%2950) | -0.0651 0.0004 (%2950) | -0.0463 0.0119 (%2950) | -0.0534 0.0037 (%2950) | -0.0270 0.1433 (%2950) | -0.0223 0.2257 (%2950) | 1.0000 0.0000 (%2950) | -0.0355 0.0536 (%2950) | -0. |
| VAR10 | -0.1052 0.0000 (%2950) | -0.0460 0.0124 (%2950) | -0.0899 0.0000 (%2950) | -0.0640 0.0005 (%2950) | -0.0737 0.0001 (%2950) | -0.0372 0.0432 (%2950) | -0.0308 0.0942 (%2950) | -0.0355 0.0536 (%2950) | 1.0000 0.0000 (%2950) | -0. |
| VAR11 | -0.1044 0.0000 (%2950) | -0.0457 0.0131 (%2950) | -0.0892 0.0000 (%2950) | -0.0635 0.0006 (%2950) | -0.0731 0.0001 (%2950) | -0.0369 0.0448 (%2950) | -0.0306 0.0968 (%2950) | -0.0353 0.0555 (%2950) | -0.0487 0.0081 (%2950) | 1. |
| VAR12 | -0.0661 0.0003 (%2950) | -0.0239 0.1167 (%2950) | -0.0564 0.0022 (%2950) | -0.0402 0.0291 (%2950) | -0.0463 0.0119 (%2950) | -0.0234 0.2044 (%2950) | -0.0194 0.2934 (%2950) | -0.0223 0.2257 (%2950) | -0.0308 0.0942 (%2950) | -0. |
| VAR13 | -0.0813 0.0000 (%2950) | -0.0356 0.0535 (%2950) | -0.0693 0.0002 (%2950) | -0.0494 0.0072 (%2950) | -0.0570 0.0020 (%2950) | -0.0288 0.1183 (%2950) | -0.0238 0.1960 (%2950) | -0.0273 0.1359 (%2950) | -0.0379 0.0394 (%2950) | -0. |
| VAR19 | -0.0690 0.0002 (%2950) | -0.0302 0.1012 (%2950) | -0.0590 0.0014 (%2950) | -0.0420 0.0227 (%2950) | -0.0483 0.0086 (%2950) | -0.0244 0.1849 (%2950) | -0.0202 0.2724 (%2950) | -0.0233 0.2057 (%2950) | -0.0322 0.0805 (%2950) | -0. |
| VAR20 | -0.1420 0.0000 (%2950) | -0.0621 0.0008 (%2950) | -0.1213 0.0000 (%2950) | -0.0863 0.0000 (%2950) | -0.0995 0.0000 (%2950) | -0.0302 0.0064 (%2950) | -0.0416 0.0239 (%2950) | -0.0480 0.0092 (%2950) | -0.0662 0.0003 (%2950) | -0. |
| VAR21 | -0.0661 0.0003 (%2950) | -0.0239 0.1167 (%2950) | -0.0564 0.0022 (%2950) | -0.0402 0.0291 (%2950) | -0.0463 0.0119 (%2950) | -0.0234 0.2044 (%2950) | -0.0194 0.2934 (%2950) | -0.0223 0.2257 (%2950) | -0.0308 0.0942 (%2950) | -0. |
| VAR22 | -0.0661 0.0003 (%2950) | -0.0239 0.1167 (%2950) | -0.0564 0.0022 (%2950) | -0.0402 0.0291 (%2950) | -0.0463 0.0119 (%2950) | -0.0234 0.2044 (%2950) | -0.0194 0.2934 (%2950) | -0.0223 0.2257 (%2950) | -0.0308 0.0942 (%2950) | -0. |
| VAR23 | -0.0843 0.0000 (%2950) | -0.0368 0.0454 (%2950) | -0.0720 0.0001 (%2950) | -0.0512 0.0054 (%2950) | -0.0590 0.0014 (%2950) | -0.0239 0.1055 (%2950) | -0.0247 0.1803 (%2950) | -0.0285 0.1223 (%2950) | -0.0393 0.0328 (%2950) | -0. |
| VAR24 | -0.0655 0.0004 (%2950) | -0.0288 0.1201 (%2950) | -0.0536 0.0024 (%2950) | -0.0378 0.0306 (%2950) | -0.0459 0.0127 (%2950) | -0.0232 0.2086 (%2950) | -0.0192 0.2978 (%2950) | -0.0221 0.2298 (%2950) | -0.0305 0.0973 (%2950) | -0. |
| VAR25 | -0.0793 0.0000 (%2950) | -0.0347 0.0597 (%2950) | -0.0637 0.0002 (%2950) | -0.0481 0.0088 (%2950) | -0.0555 0.0026 (%2950) | -0.0231 0.1277 (%2950) | -0.0232 0.2077 (%2950) | -0.0238 0.1459 (%2950) | -0.0370 0.0446 (%2950) | -0. |
| VAR26 | -0.0702 0.0001 (%2950) | -0.0307 0.0957 (%2950) | -0.0599 0.0011 (%2950) | -0.0427 0.0205 (%2950) | -0.0491 0.0075 (%2950) | -0.0248 0.1778 (%2950) | -0.0205 0.2345 (%2950) | -0.0217 0.1932 (%2950) | -0.0327 0.0758 (%2950) | -0. |
| SITE | 0.1277 0.0000 (%2950) | -0.0024 0.8956 (%2950) | 0.0558 0.0024 (%2950) | -0.2457 0.0000 (%2950) | 0.0126 0.3071 (%2950) | -0.0170 0.4696 (%2950) | -0.0017 0.5205 (%2950) | -0.0140 0.4477 (%2950) | 0.0074 0.6864 (%2950) | -0. |
| TIME | 0.0025 0.8923 (%2950) | 0.0131 0.4778 (%2950) | -0.1360 0.0000 (%2950) | 0.0929 0.0000 (%2950) | 0.1415 0.0000 (%2950) | 0.0222 0.2239 (%2950) | 0.0219 0.2257 (%2950) | 0.0042 0.3202 (%2950) | 0.0297 0.1076 (%2950) | -0. |

10/1

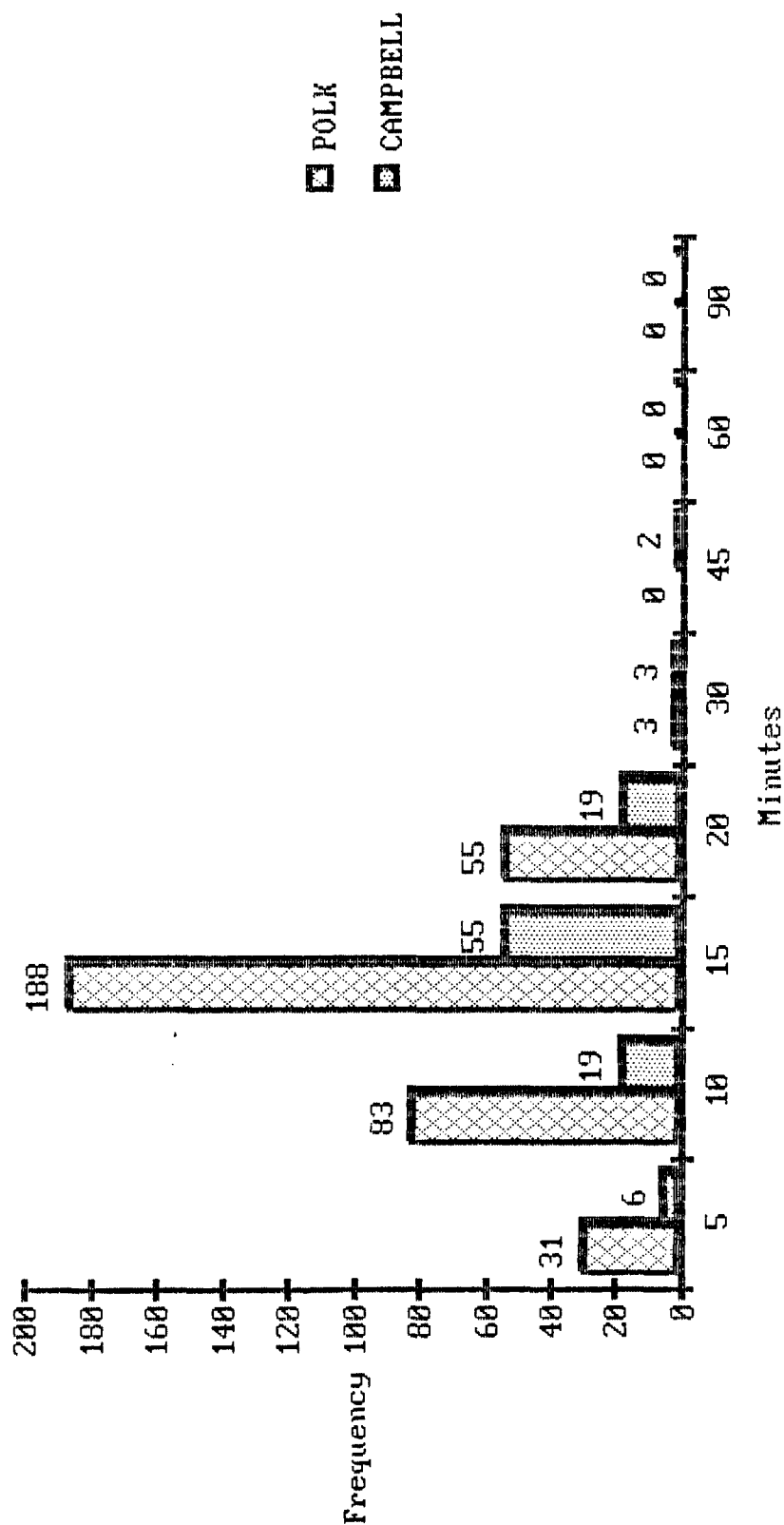
APPENDIX C

FIGURES OF FREQUENCY DISTRIBUTION

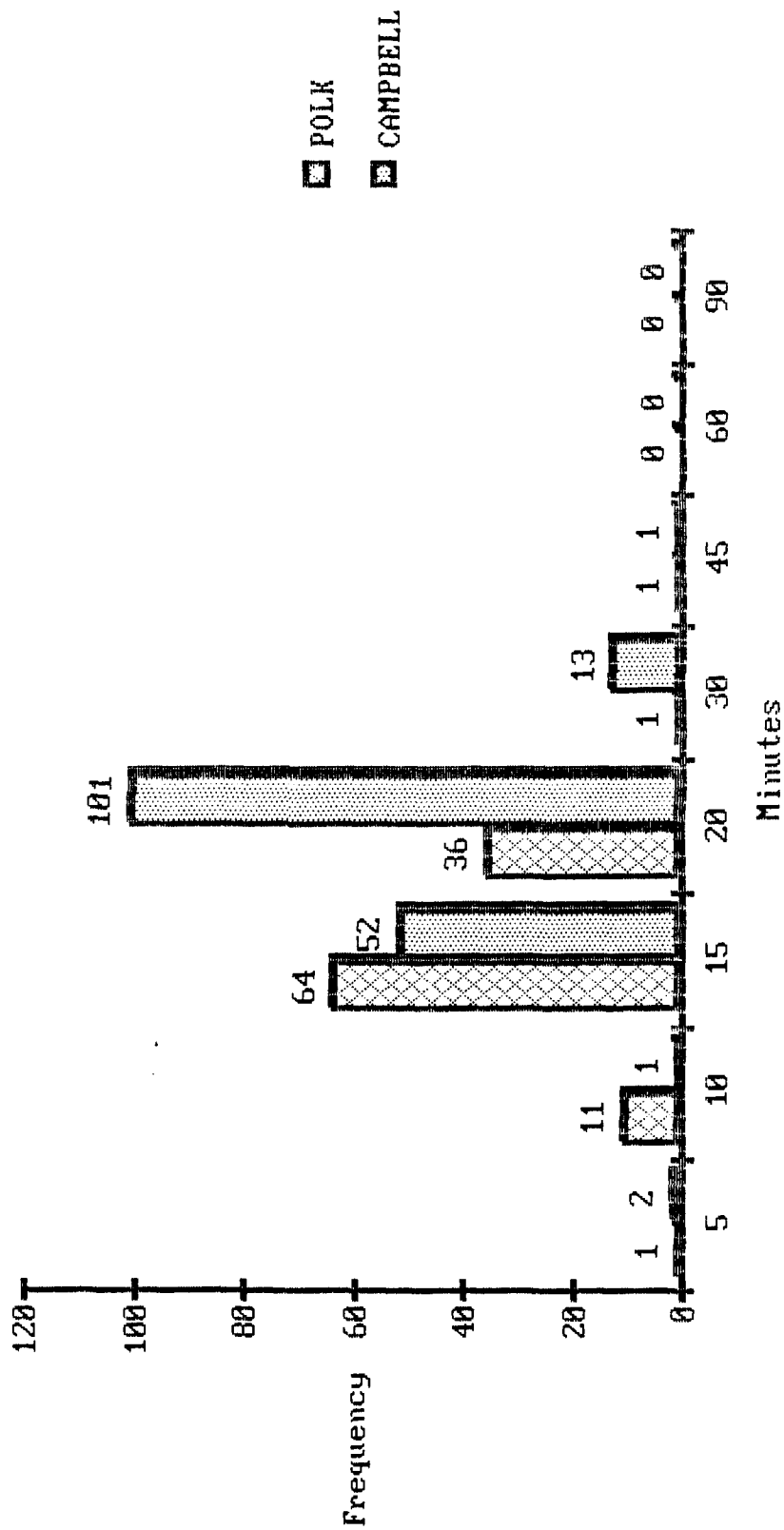
FREQUENCY DISTRIBUTION
V22 - Pregnancy, Normal



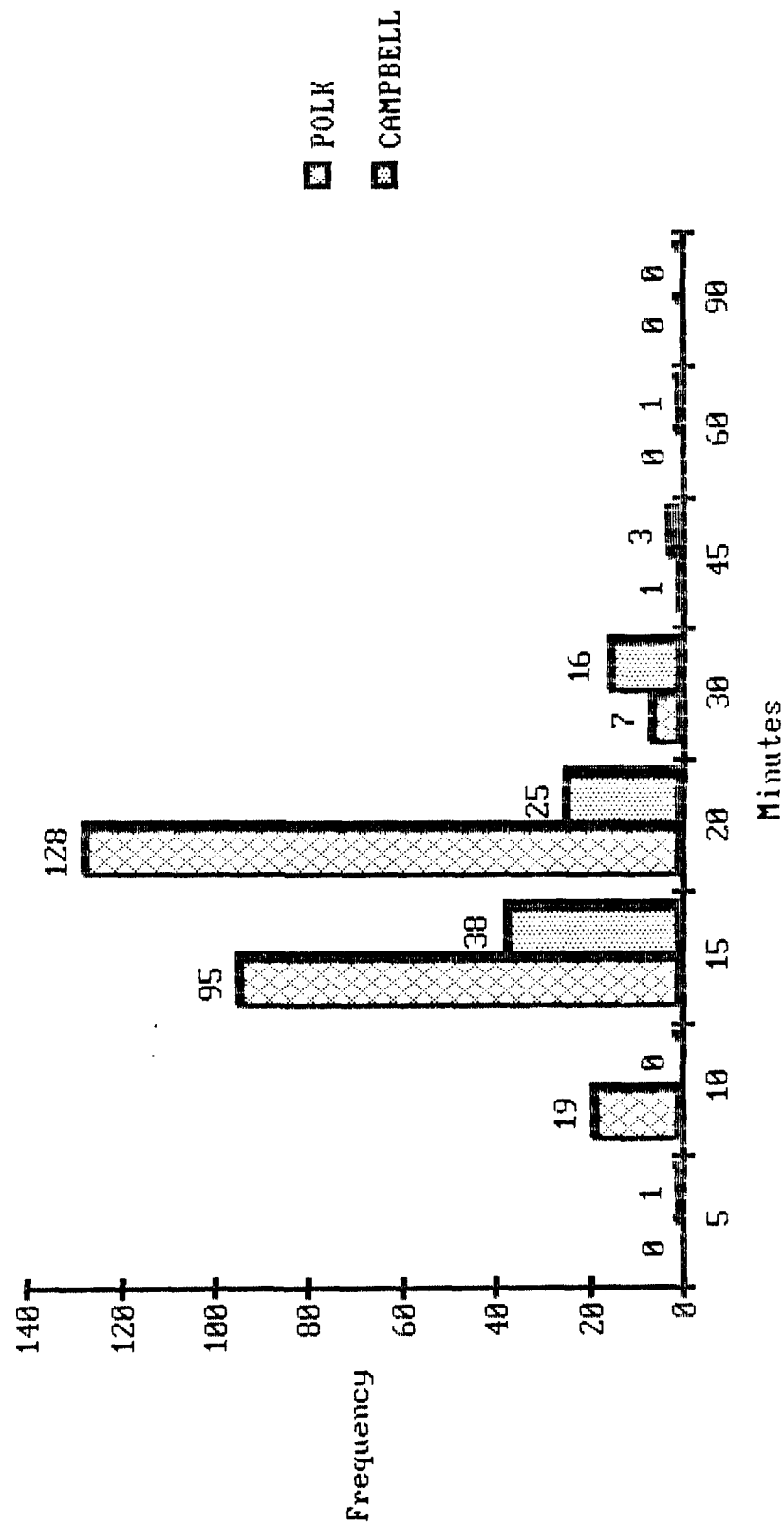
FREQUENCY DISTRIBUTION
U655 - No Problem Noted



FREQUENCY DISTRIBUTION
0700 - Exam, Medical

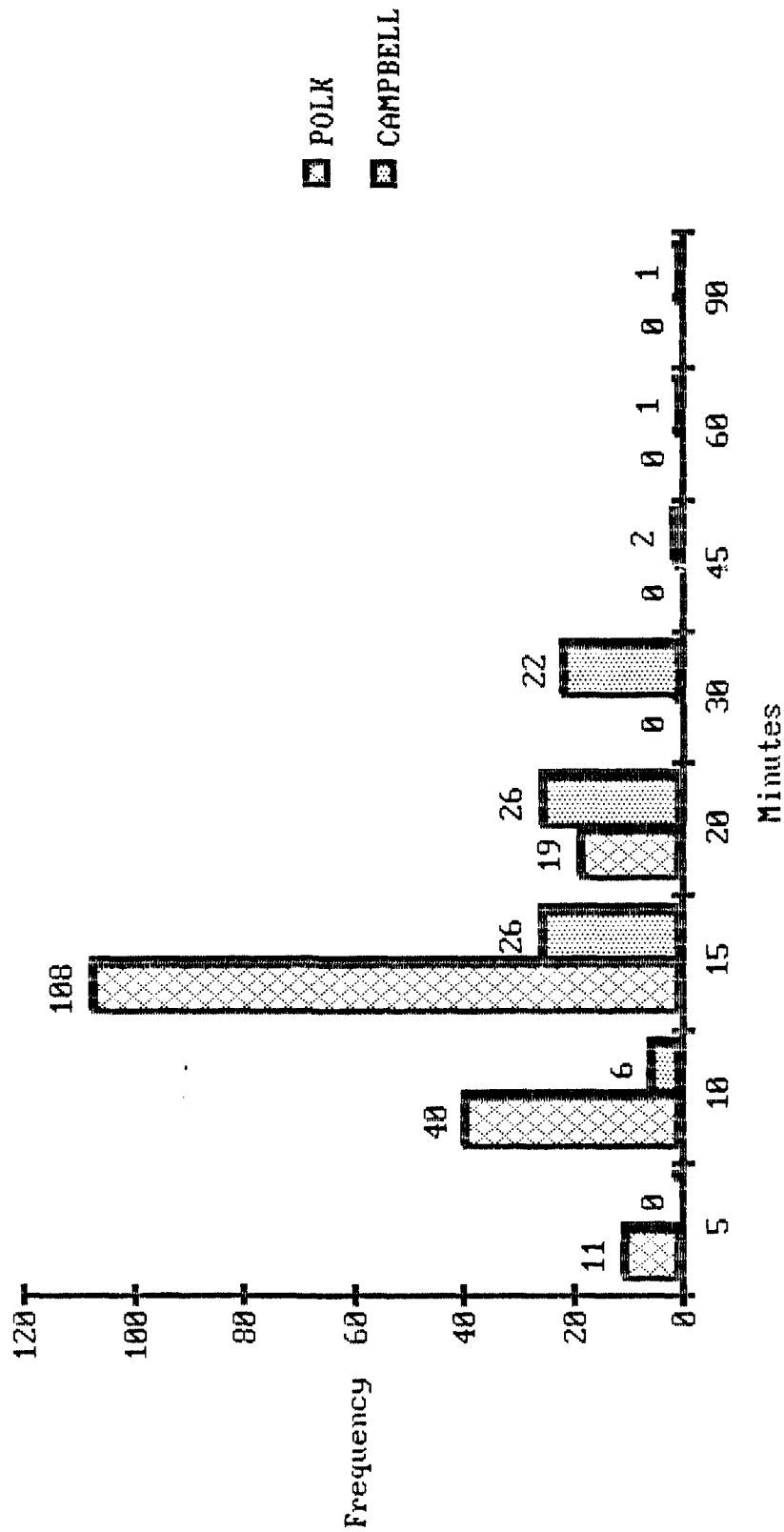


FREQUENCY DISTRIBUTION
 07231 - Exam, Well Woman

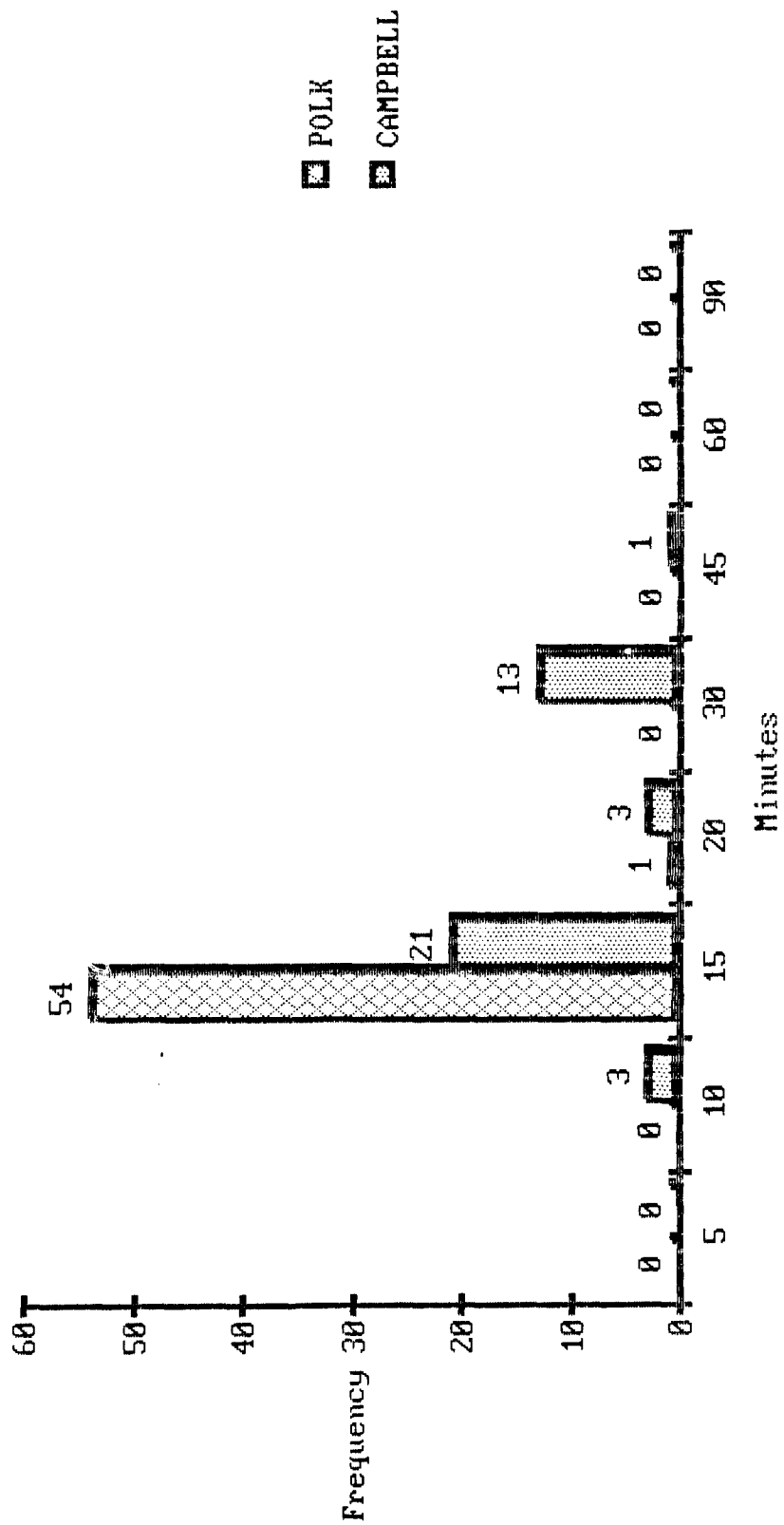


FREQUENCY DISTRIBUTION

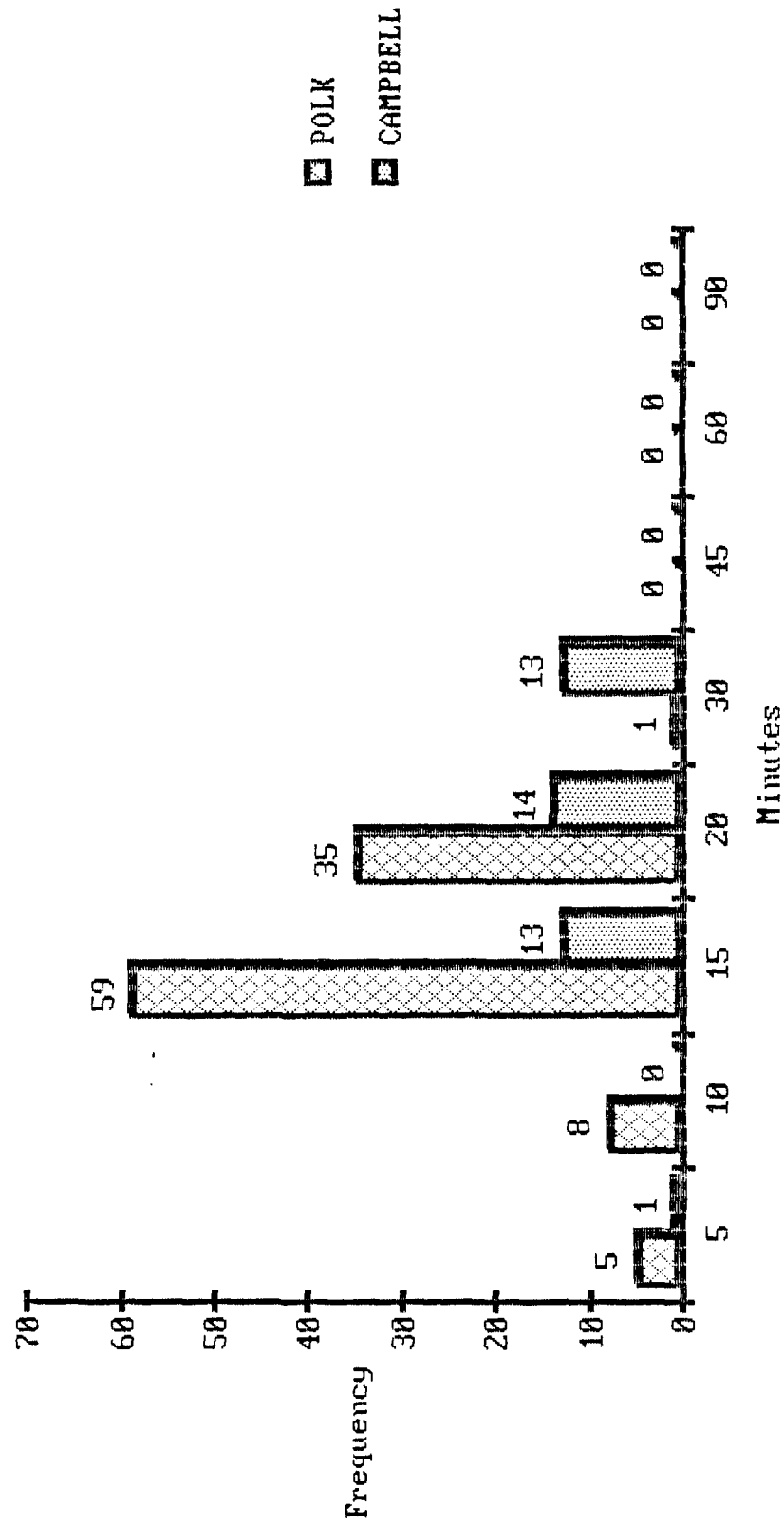
3820 - Otitis Media, Suppurative, Acute



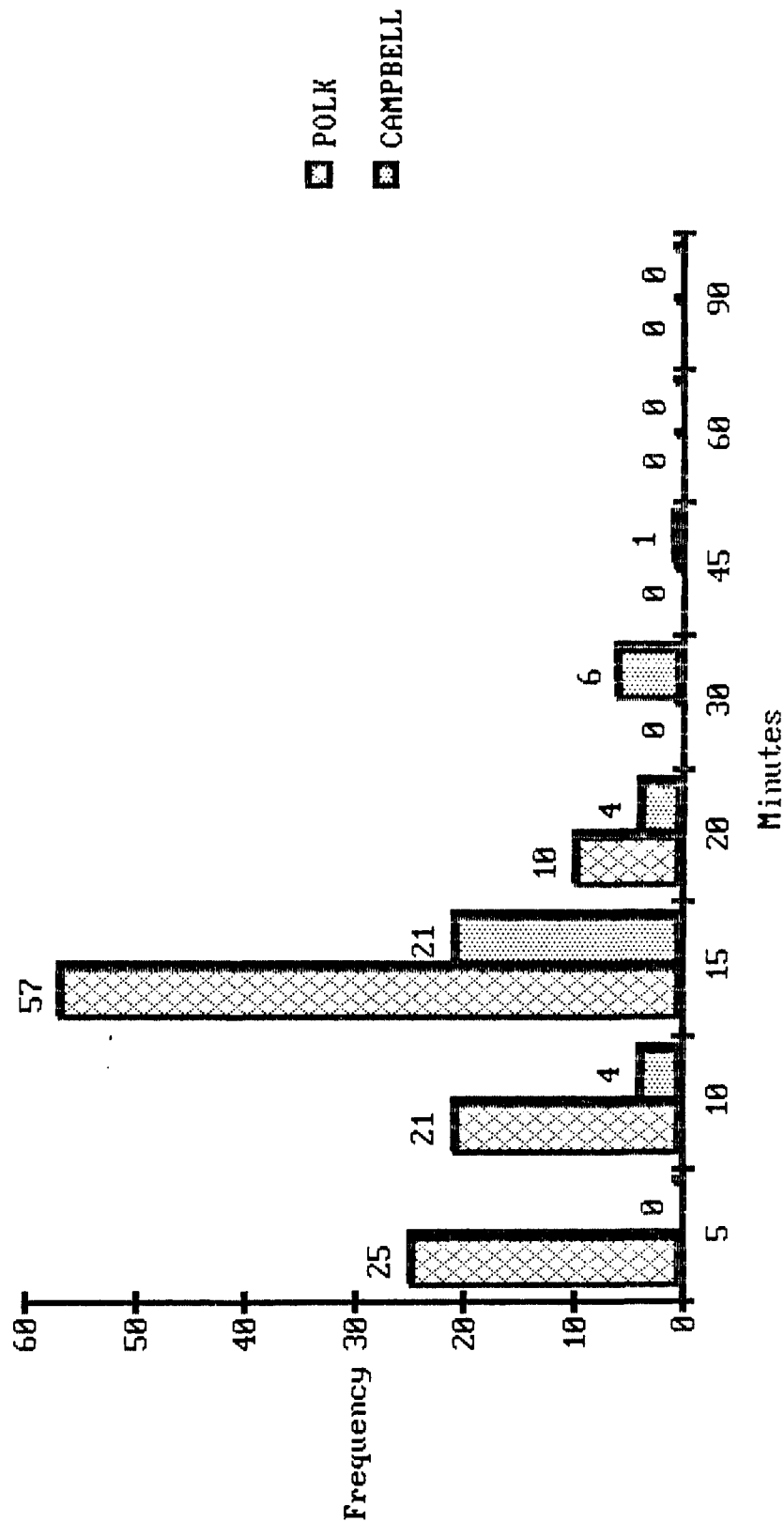
FREQUENCY DISTRIBUTION
v202 - Surveillance Health Development



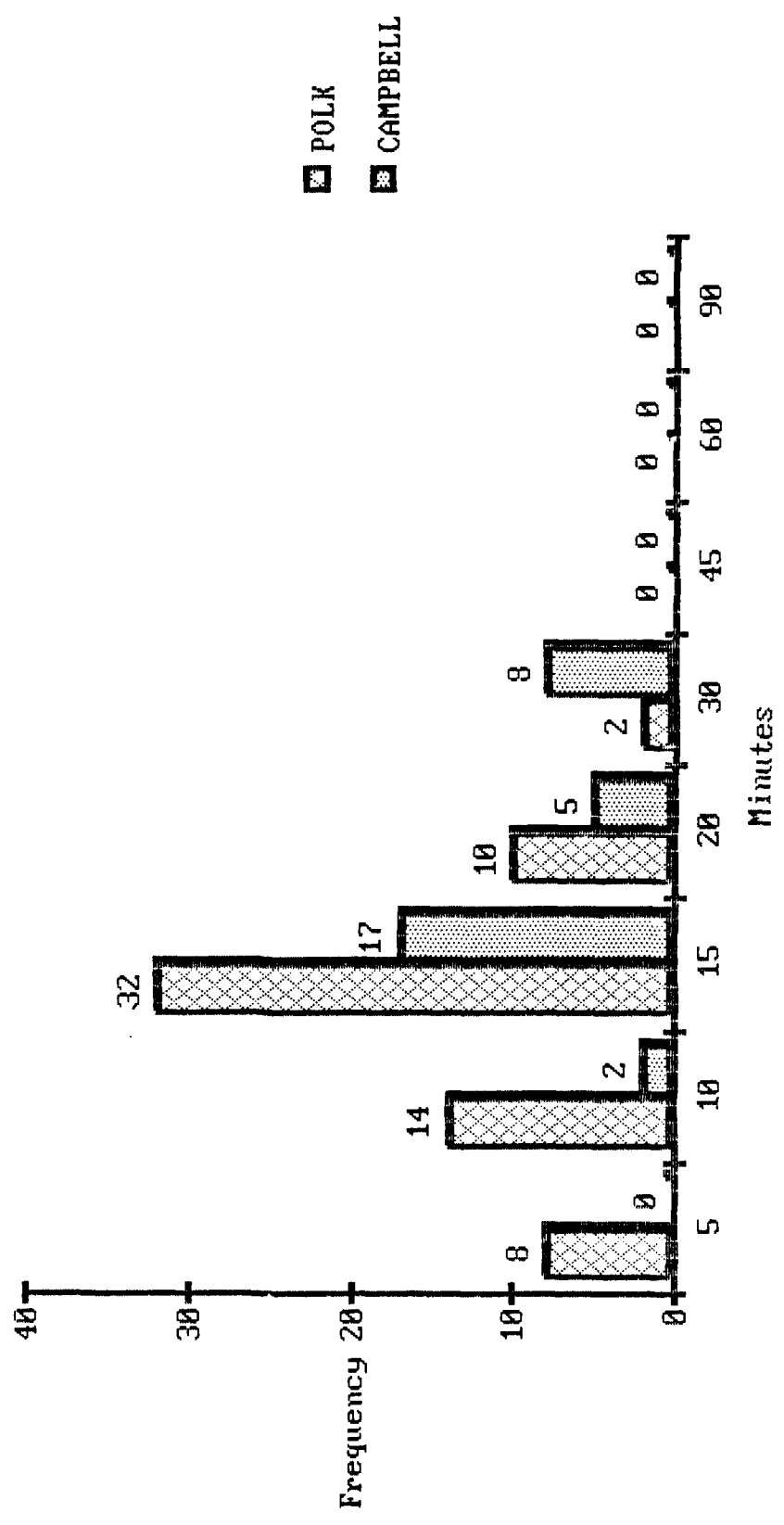
FREQUENCY DISTRIBUTION
401 - Hypertension, Essential



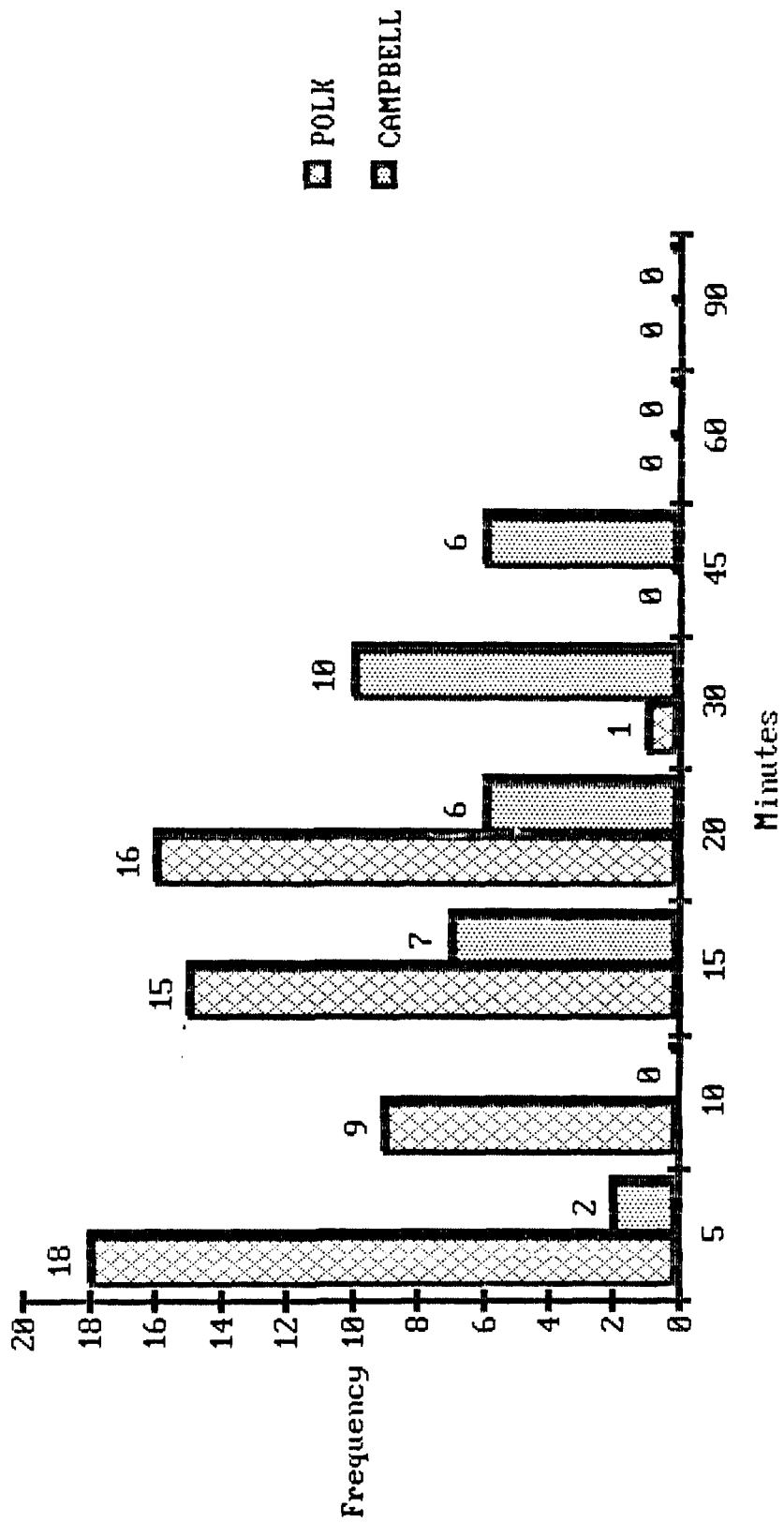
FREQUENCY DISTRIBUTION
460 - Nasopharyngitis, Acute (Common Cold)



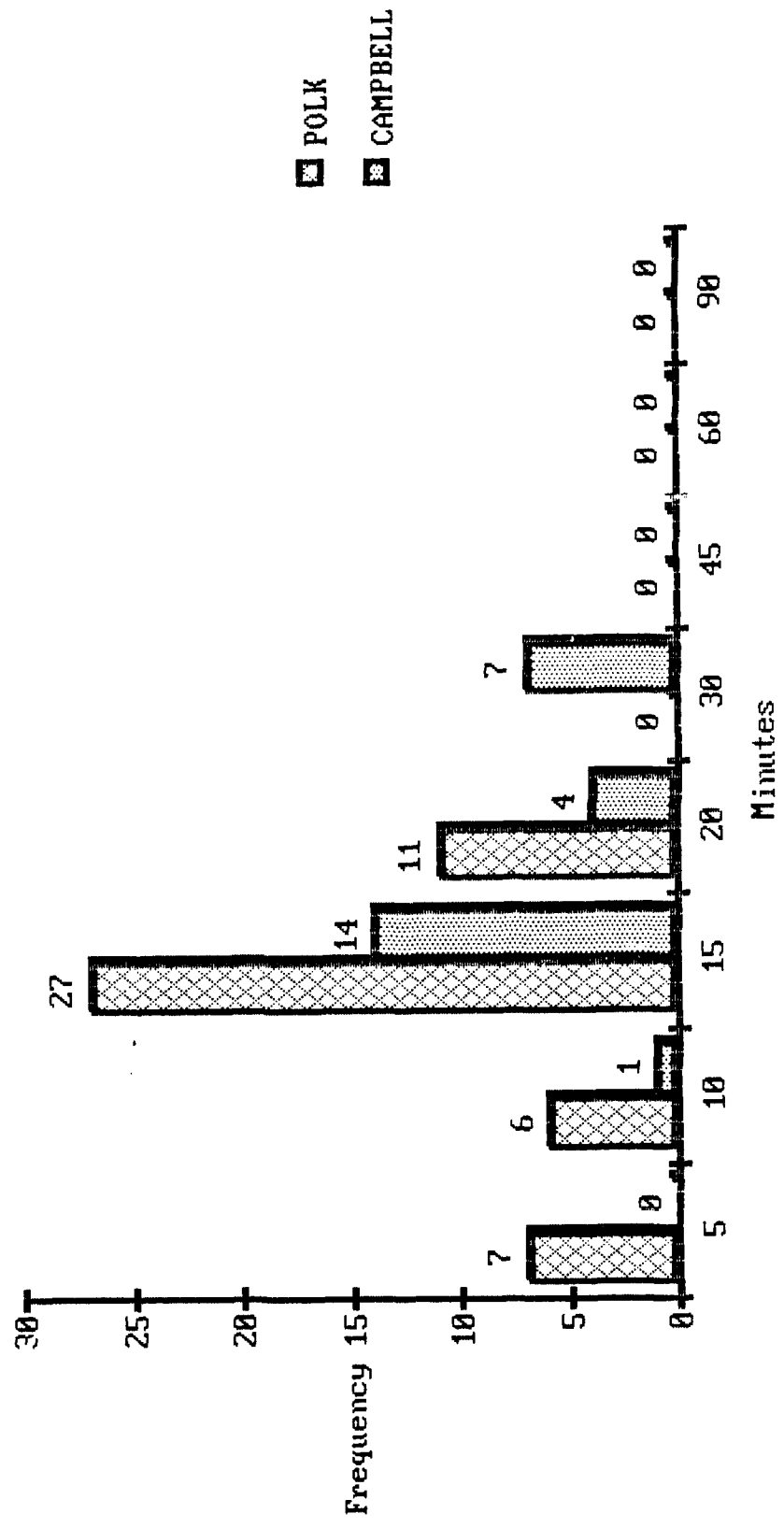
FREQUENCY DISTRIBUTION
 7821 - Rash (Exanthems), NOS



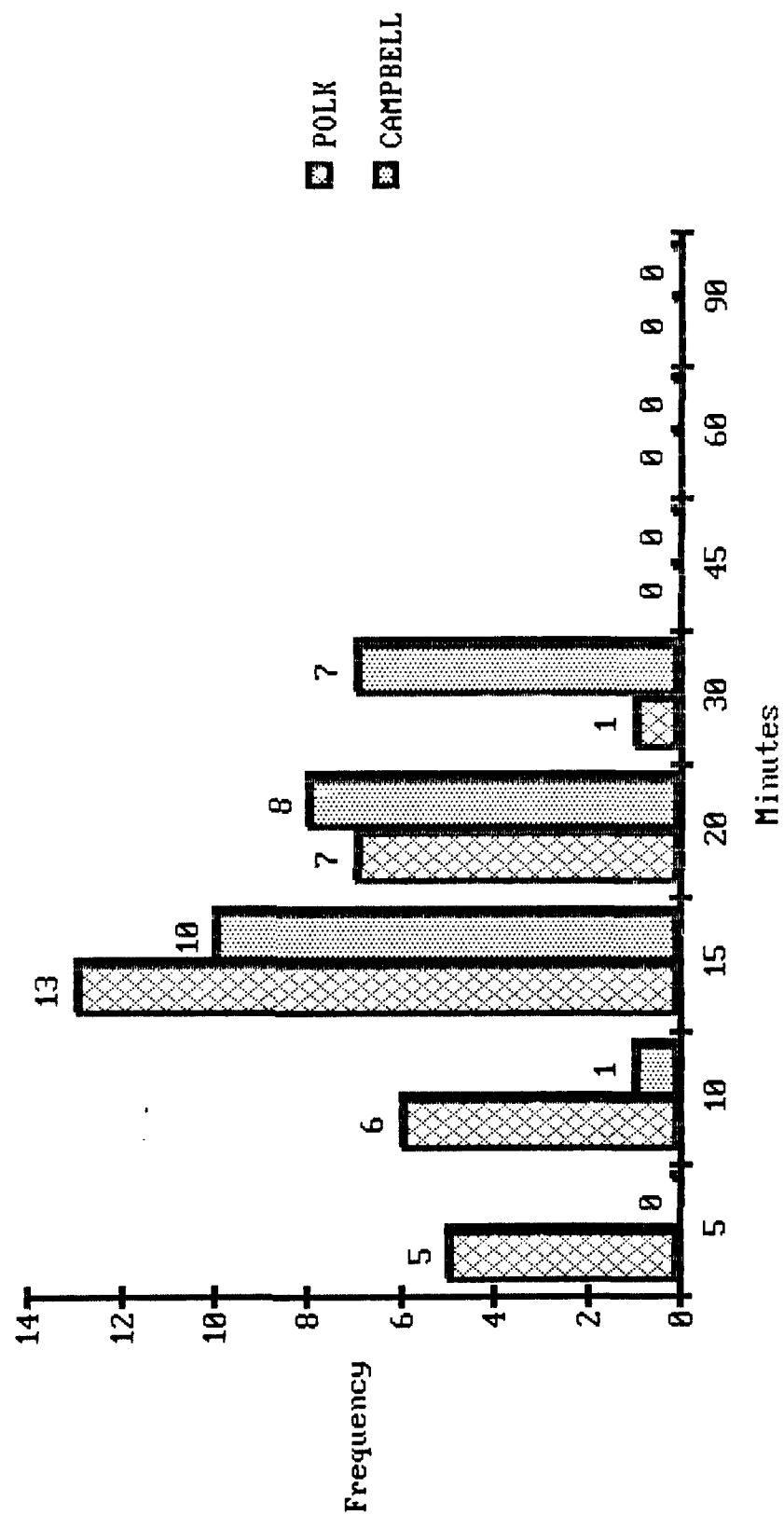
FREQUENCY DISTRIBUTION
000 - No Diagnosis/Reason Recorded by Provider



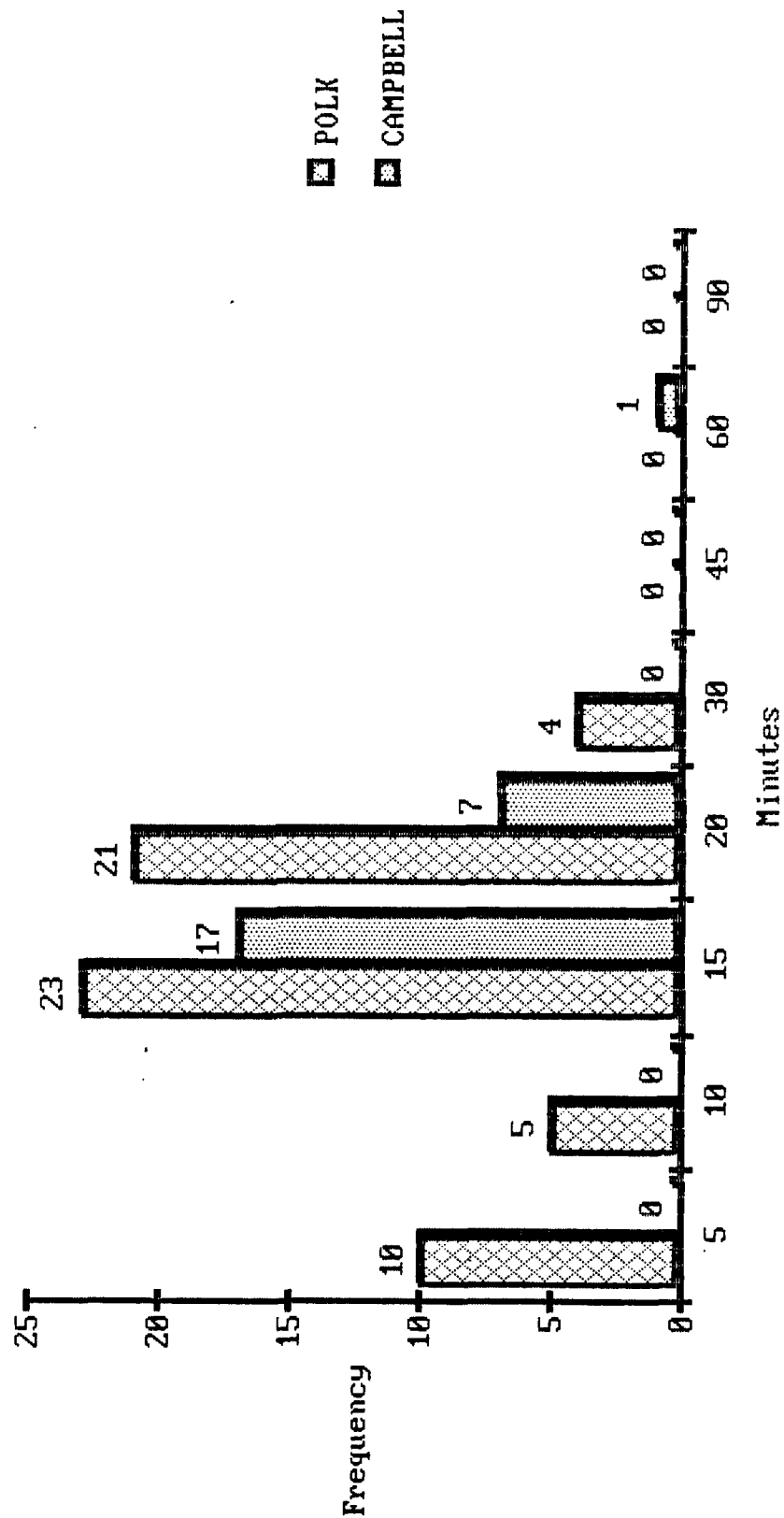
FREQUENCY DISTRIBUTION
0340 - Pharyngitis with Streptococcal



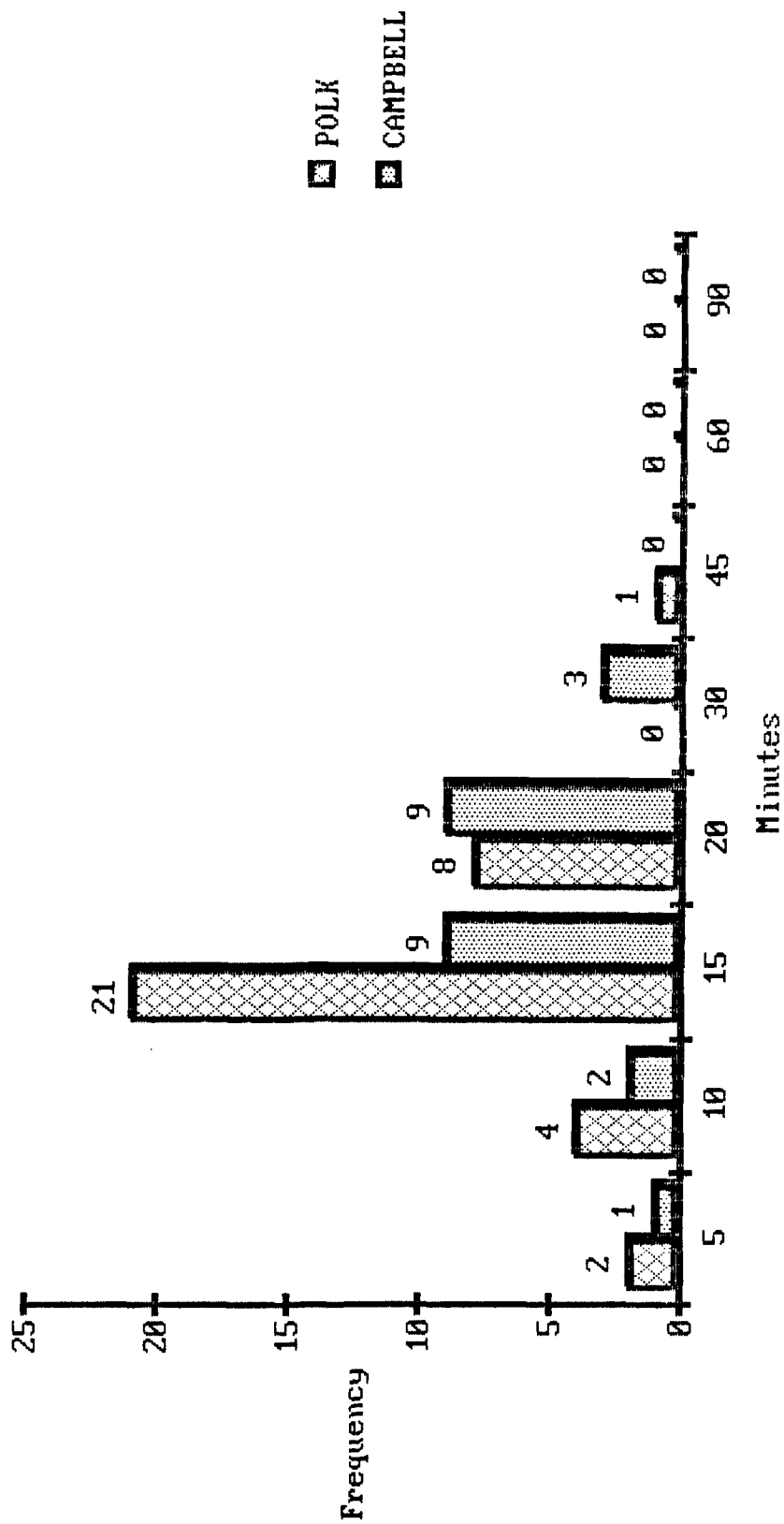
FREQUENCY DISTRIBUTION
7194 - Arthralgia



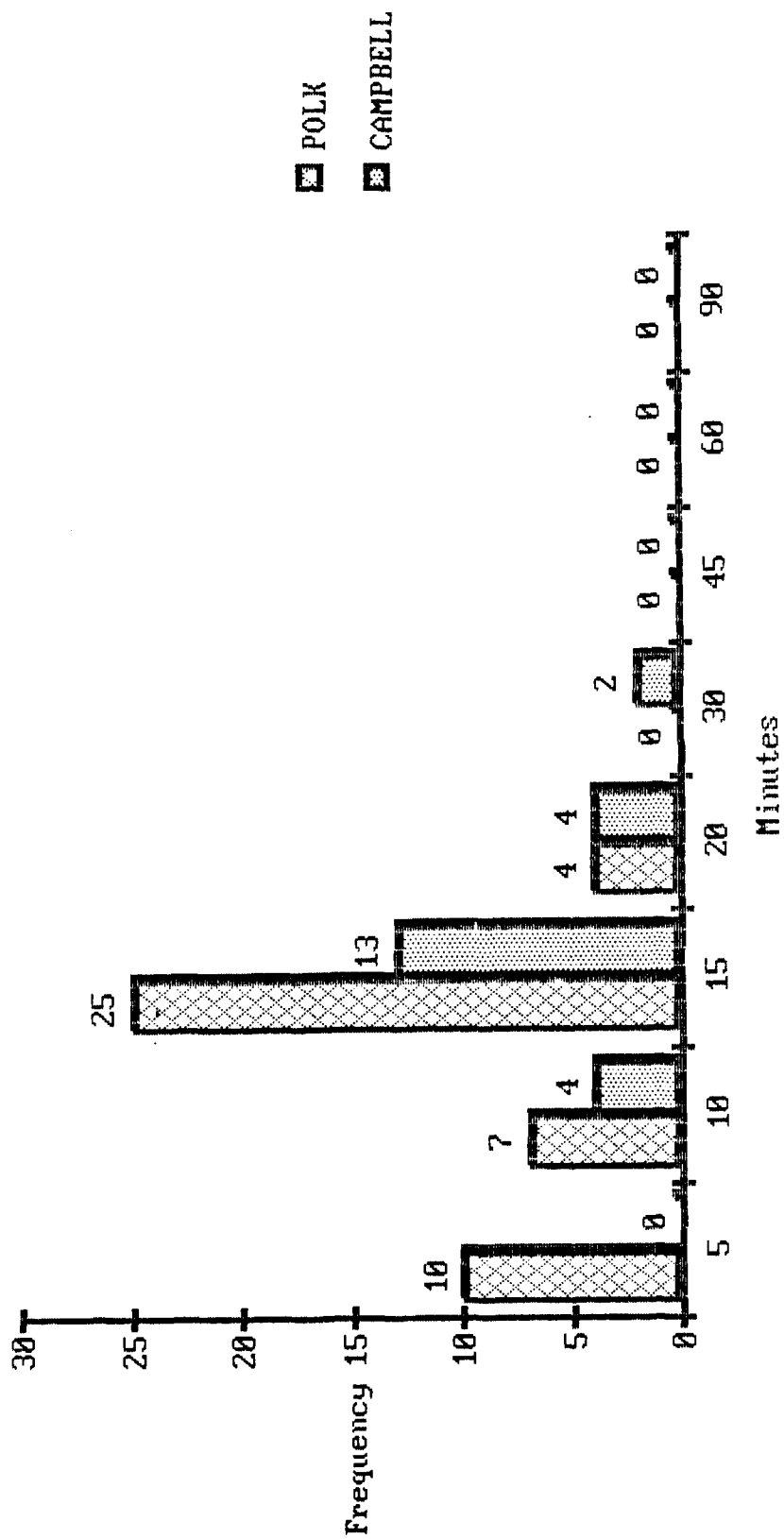
FREQUENCY DISTRIBUTION
7890 - Pain, Abdominal



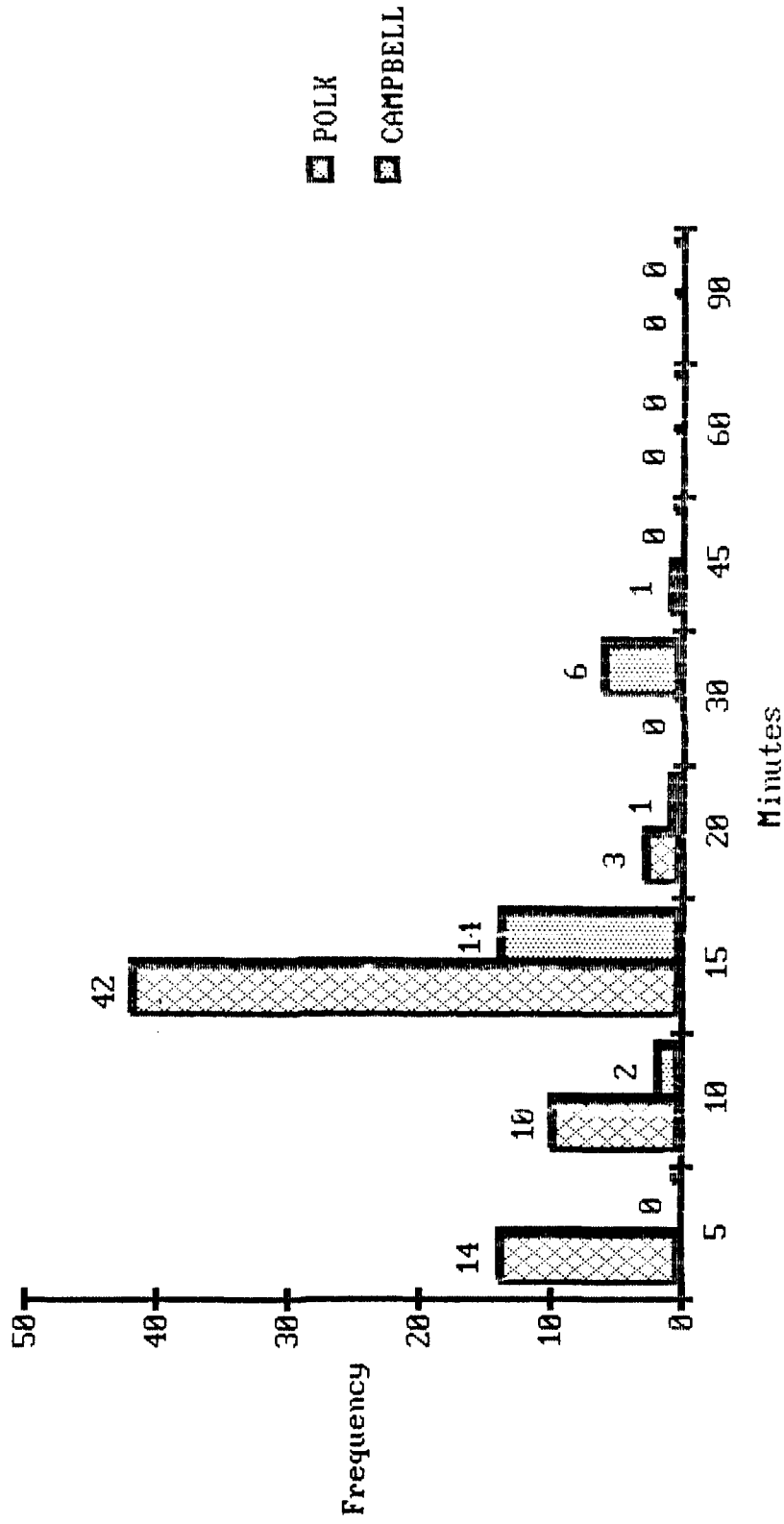
FREQUENCY DISTRIBUTION
461 - Sinusitis, Acute



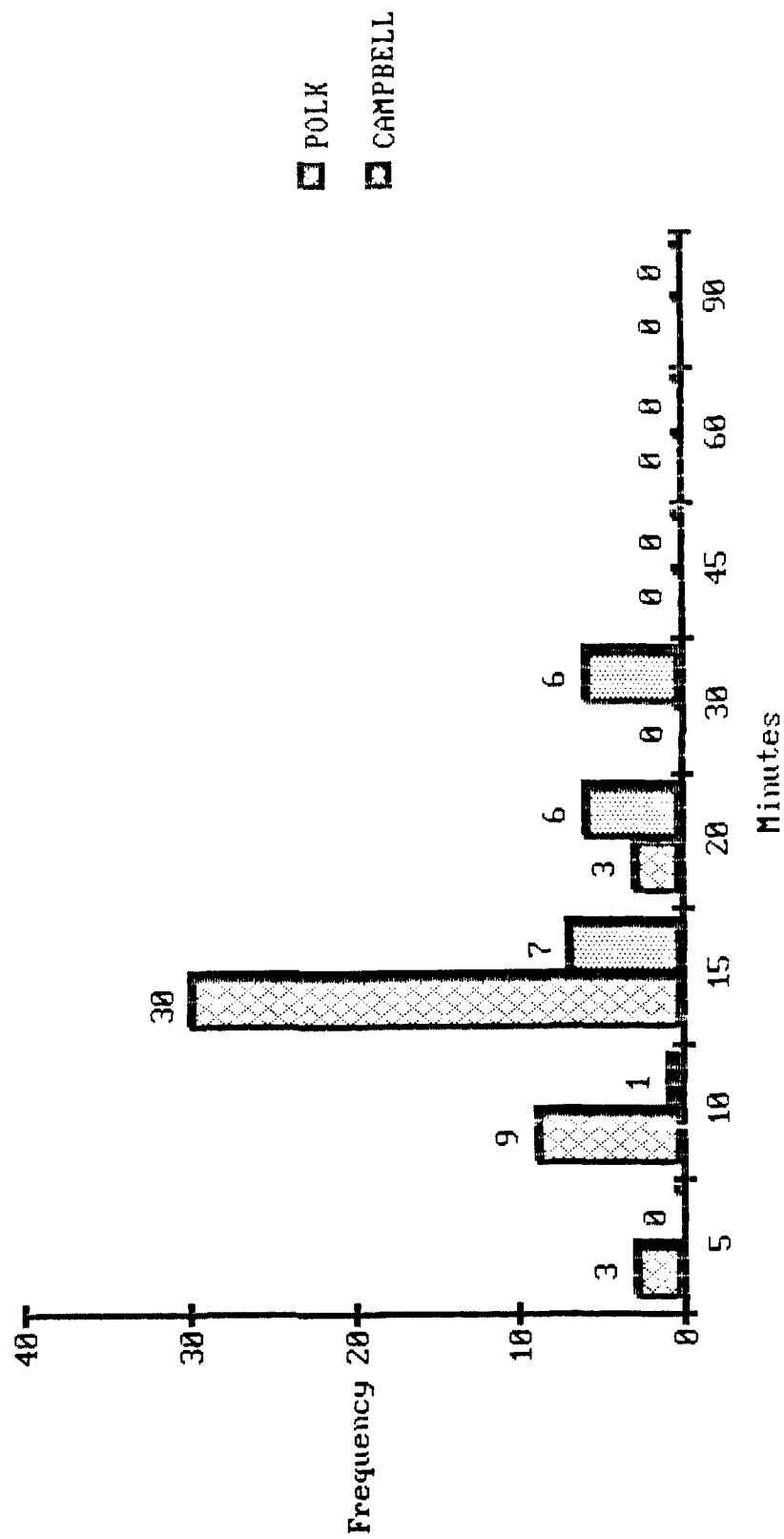
FREQUENCY DISTRIBUTION
37230 - Conjunctivitis



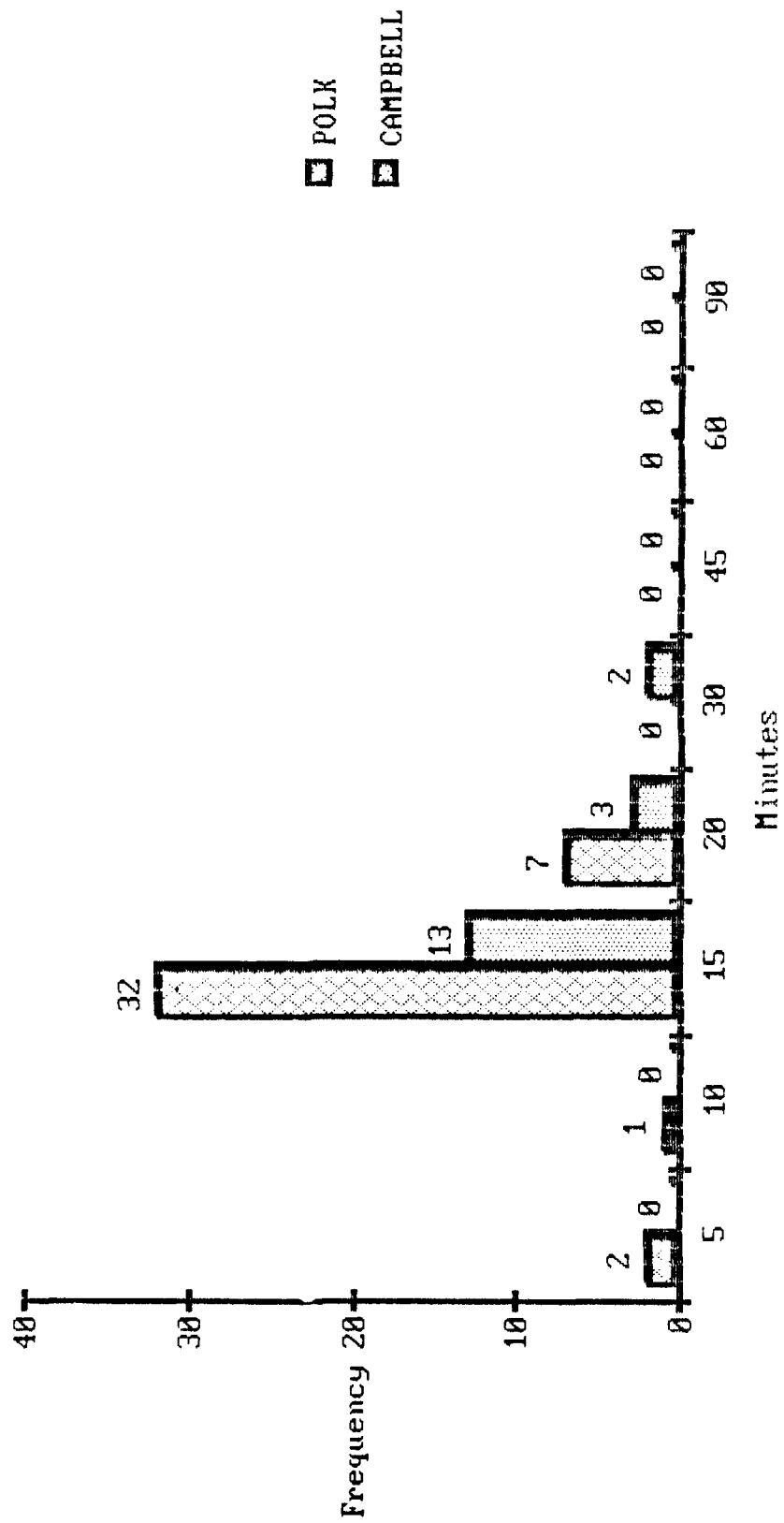
FREQUENCY DISTRIBUTION
462 - Pharyngitis, Acute



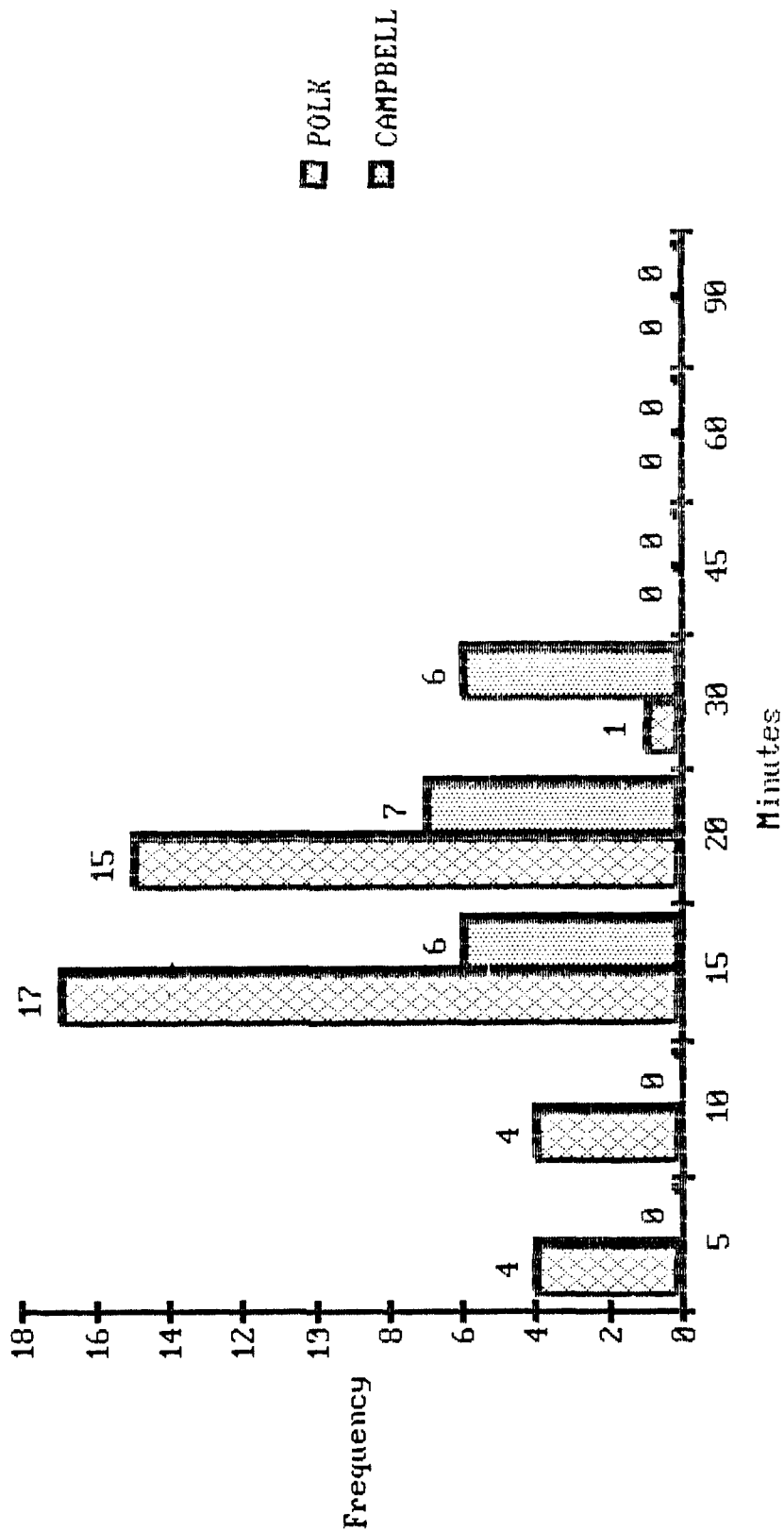
FREQUENCY DISTRIBUTION
 3814 - Otitis Media, Serous



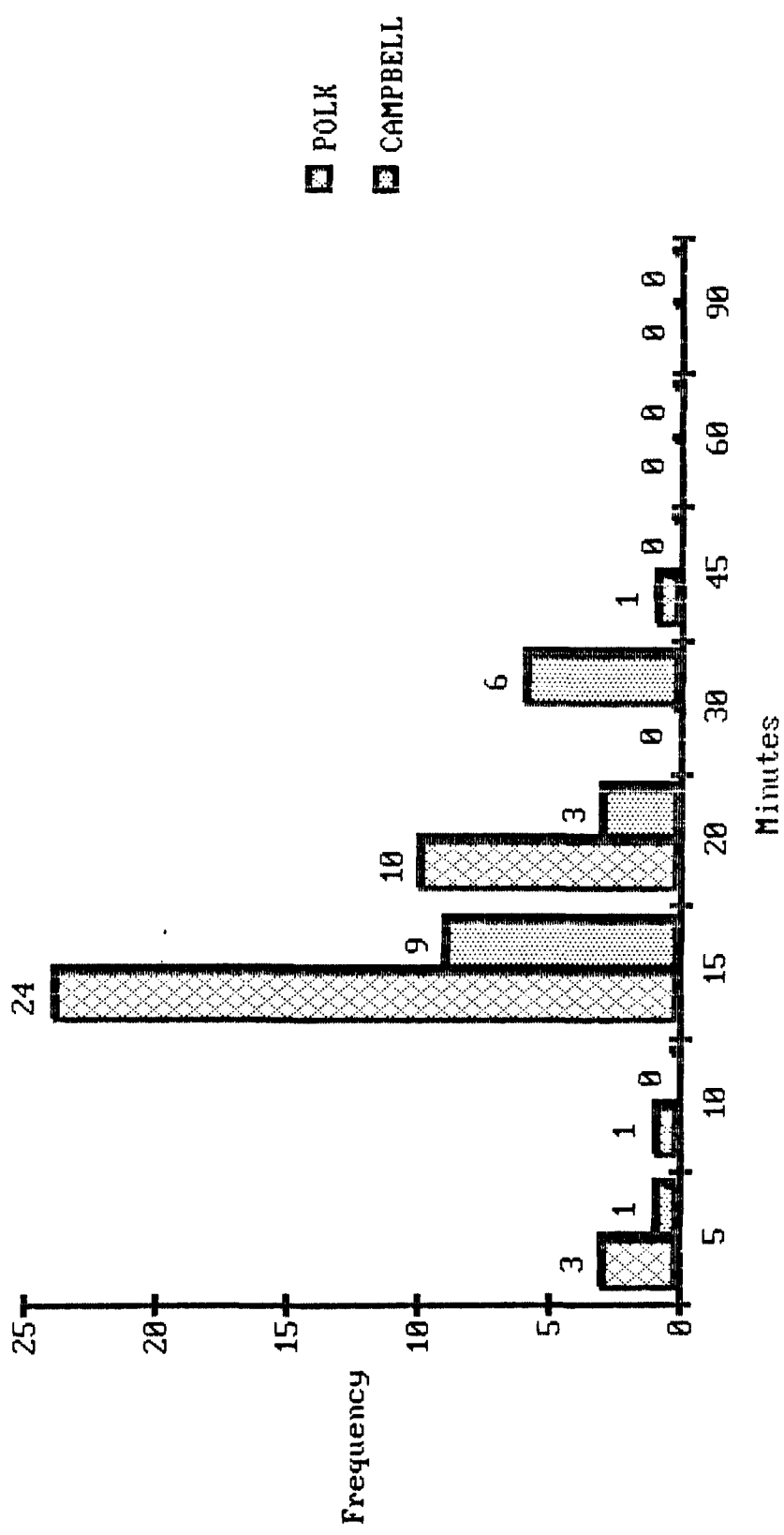
FREQUENCY DISTRIBUTION
7245 - Pain, Back, NOS



FREQUENCY DISTRIBUTION
250 - Diabetes Mellitus



FREQUENCY DISTRIBUTION
7848 - Headache



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